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ON THE PREPARATIONS OF STROPHANTHUS.

By Horatio C. Wood, M.D., and William S. Carter, M.D.

Report of Research Committee on Pharmacodynamics, of the Committee o Revision of the United States Pharmacopœia.

The United States Pharmacopœia of 1890 recognizes only one preparation of the important drug strophanthus, namely, the tincture. It is, however, in practice, very often desirable to give strophanthus with other drugs in pill form, and the present research was made to test the activity of the best commercial strophanthin, and also of an extract. *A priori*, there is no reason for supposing that the extract will not be an effective preparation; but in order to determine the question positively, we have made, in the Physiological Laboratory of the University, a series of experiments with the drug upon mammals. The extract was made by Dr. Charles Rice, by evaporating the tincture. Of it he says:

Extract of Strophanthus.—Each 1 gramme of this corresponds to 4·127 grammes of strophanthus seed, or to 82·5 c.c. of the official tincture. I did not attempt to bring the extract to a definite weight, bearing a simple proportion to the crude drug or the tincture, since it is just as easy, or rather easier, to weigh out such a quantity of the extract as will make a solution of any desired strength.

The following are the experiments made with this extract. In each of them a solution of the extract of strophanthus was made, 0·1 gramme in 1,000 c.c. of water, given by injection into the jugular vein.

Experiment 1.—Dog; weight, 8·6 kilos.

Arterial pressure, 92; 5 c.c. were given. The arterial pressure rose in one minute 5 mm., when 5 c.c. more were injected. In one

minute, pressure rose 5 mm. more, when 10 c.c. were administered, followed in one minute by a rise of 7 mm., making 17 in all. Nine minutes later, the pressure had fallen almost to the normal, when 20 c.c. were given in the course of one minute, and the pressure began to rise. Three minutes later, it was 18 mm. above the normal.

Experiment 2.—Dog; weight, 14 kilos.

Arterial pressure, 146; 5 c.c. given; no distinct effect. In three minutes, 5 c.c. more given with no distinct effect; in seven minutes, 8 c.c. more given, making 18 c.c. in ten minutes. One minute later, rise of 6 mm.; one minute later, further rise of 14 mm., making 20 mm. above the normal. Two minutes later, pressure 22 mm. above the normal. Seven minutes later, 10 c.c. were given, when the pressure began to fall rapidly, and two minutes later was 74 mm. below the normal. The dog died thirty seconds after this, of cardiac arrest.

Experiment 3—Dog; weight, 8·6 kilos.

Arterial pressure, 146; 3 c.c. given. Three minutes later, pressure 20 mm. above the normal; five minutes after first injection, 5 c.c. given; three minutes later, the pressure was 32 mm. above the normal. Five minutes after this, the pressure was 10 mm. above the normal. Another 5 c.c. given; pressure rose in one minute to 46 mm. above the normal; half a minute later, was 52 mm. above the normal; one minute later, was 56 mm. above the normal. Dog lived for twenty-four minutes after this.

Experiment 4.—Dog; weight, 5·3 kilos.

Spinal cord cut so as to produce vasomotor paralysis.

Arterial pressure, 22; 3 c.c. in one minute put up the pressure 10 mm.; a subsequent injection of 3 c.c. more was followed by no rise of pressure, which was steady 8 to 10 mm. above the normal for seven minutes. Another 3 c.c. was given; this produced a steady pressure of from 10 to 12 mm. above the normal. In thirteen minutes, another 5 c.c. was given, followed by a rise in half a minute of the pressure to 22 mm. above the normal. This rise amounted to 50 per cent. of the whole pressure, which had been 22 mm. (after section of the cord). Dog died shortly afterwards.

An examination of these experiments will show that the extract

of strophanthus is an active preparation. The fact of the great percentage of rise in the last experiment, when the spinal cord had been previously cut and the vasomotor system paralyzed, is very interesting as an evidence of the little action which this drug has upon the vasomotor centres, as compared with what it has upon the heart and vessel walls. A comparison of our experiments will also show the great difficulty there is in testing drugs by comparative experiments upon the lower animals, the amount of rise in individual cases produced by the injection being entirely out of proportion to the relation between the dose given and the weight of the animal.

If the extract should, as we believe it ought to be introduced into the United States Pharmacopœia, it is evident that it should be made by a process which will give a fixed product for the amount of drug used. Every practitioner of medicine, in thinking of strophanthus therapeutically, thinks not of the drug itself, but of the tincture. Ordinarily the doctor has no knowledge how much the tincture of strophanthus represents, his unit of work in his own mind being 5 or 10 minims of the tincture. The extract should therefore bear relation to the tincture. It would not take many pharmaceutical experiments to determine what proportion of extract the official tincture would yield on evaporation, and it would be pharmaceutically very easy to add to this extract so that the one-eighth or the one-fourth of a grain, as the case may be, would represent 5 minims of the tincture.

STROPHANTHIN.

We have also made a series of experiments with commercial strophanthin, furnished us by Dr. Charles Rice.

The solution used in experiments 1 and 2 was made by dissolving 0·1 gramme of the strophanthin in 100 c.c. of water. 1 c.c. of it, therefore, represented 0·001 gramme of the strophanthin, or 1 milligramme. The solution was always thrown directly into the jugular vein.

Experiment 1.—Dog; weight, 20·5 kilos.

2 c.c. of the solution caused a rise of 65 mm. in four minutes, which was maintained for eight minutes, when 2 c.c. more of the solution were given, followed by a fatal arrest of the heart's action in one and one-half minutes.

Experiment 2.—Dog; weight, 15·5 kilos.

1 c.c. elevated the pressure 14 mm. in one minute, when a second 1 c.c. was given; the result being that in seven minutes the pressure was increased 62 mm. above the normal. After this, 1 c.c. was administered, followed by cardiac arrest in nine minutes and ten seconds.

Experiments 3, 4, 5, 6, 7, were made with a solution of 0·1 gramme in 1,000 c.c. of water; of this solution, therefore, 10 c.c. equalled 1 milligramme.

Experiment 3.—Dog; weight, 7 kilos.

Injected into the jugular 2 c.c. Pressure in five minutes rose to 18 mm.; eight minutes after first injection, a second of 3 c.c.; two minutes after, a third of 4 c.c. Two minutes later, pressure was 40 mm. above the normal; then began to fall and continued to fall, although an injection of 5 c.c. was given, and five minutes later another of 3 c.c. One minute after the last injection the heart stopped.

Experiment 4.—Dog; weight, 17 kilos.

5 c.c. given. One minute later, pressure rose 28 above the normal; slowly fell, however, so that ten minutes after the injection the pressure was at the normal. Another 5 c.c. given, and three minutes later 8 c.c. Pressure began to rise, and in two and one-half minutes after the last injection it was 43 mm. above the normal. One minute later it was 52 above the normal; five minutes later was 28 above the normal, and continued so for fifteen minutes, when another 5 c.c. was given. Three minutes after this, another 5 c.c. During the next six or seven minutes pressure was 30 to 40 above the normal; it then began to fall, the fall being accelerated by a further injection of 10 c.c., followed by death in three minutes, from cardiac arrest.

Experiment 5.—Dog; weight, 8·5 kilos.

Injected into the jugular 10 c.c., given slowly; one minute later, pressure up to 10 mm.; 10 c.c. given; pressure immediately rose 15 mm., and stayed so for three minutes. Two minutes later pressure at 6 mm. above the normal, remaining so for another minute, when it fell to the normal, and 10 c.c. was given. One minute later, there being no rise of pressure, another 10 c.c. was given. Pressure for the next twelve minutes after this was from 10 to 15 above the

normal. Another 10 c.c. given; half a minute after, the pressure was 18 mm. above the normal. It then began to fall and continued to do so.

Experiment 6.—Dog; weight, 14 kilos.

Injected into the jugular. Pressure very high; 5 c.c. given; thirteen minutes after, another 5 c.c. given; eight minutes later, 8 c.c. given. During the whole of this time the pressure was below the normal—from 10 to 20 mm. After the third injection the pressure began to rise, and in three minutes was 15 above the normal, and stayed at 15 to 20 above the normal for two minutes longer, when it began to fall, and, three minutes later, was below the normal. 10 c.c. given, followed by rapid fall of pressure, and death from cardiac arrest in three minutes.

Experiment 7.—Dog; weight, 8·5 kilos.

Injected into the jugular. Pressure very high; 3 c.c. given; pressure rose immediately. In three minutes was 20 above the normal. Two minutes later, 5 c.c. given. During the next nine minutes the pressure varied considerably, but was, on the average, 15 above the normal. 5 c.c. given, pressure rose in a minute to 30 above the normal. During the next nine minutes the average was 50 above the normal. 5 c.c. then given, and in five minutes the animal died from tetanus.

It is not necessary for our present purpose to discuss these experiments in detail; they are sufficient to show that the commercial strophanthin, as put upon the market by manufacturers of the first-class, is an extremely active substance.

As long ago as 1888, Rothziegel and Koralzewski reported the results of the use of strophanthin in forty-four cases of disease. They state that the influence of very small doses, 0·0002 to 0·0003 gramme, is distinctly perceptible in an increase of the force of the pulse in from five to ten minutes; but that usually in cardiac cases the disappearance of the irregularity of the heart's action was not perceived until the second or third day of treatment; that when there was dyspnœa from cardiac disease, the difficulty in breathing disappeared very rapidly. No local irritation was, in their experience, produced by the hypodermic injections of as much as 5 decimilligrammes of the strophanthin. They ordinarily gave from 1 to 3 milligrammes

in the twenty-four hours; in one case they gave 5 milligrammes for eight days, without any bad results. In two cases, however, the daily use of 3 milligrammes for two weeks caused reduction of the pulse-rate to 48 per minute, without any other accompanying symptoms. They reached the conclusion that the strophanthin was a good substitute for the tincture of strophanthus.

In looking over the records of our experiments, it will be seen that the activity of the strophanthin itself was much more marked in raising the arterial pressure than that of the extract, so that confirmation is afforded of the conclusion of Rothziegel and Koralzewski—that strophanthin is a superior preparation of the drug.

We believe, therefore, that the Pharmacopœia should recognize the active principle of strophanthus, and give appropriate tests for its purity.

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AN EXAMINATION OF SOME RECENT SUGAR REACTIONS.

BY FREDERICK W. HAUSSMANN.

According to the statements of prominent investigators, physiological glycosuria is an established fact.

The researches of Emil Fischer on carbohydrates have also found application in the analysis of urine, and the above statement has been strengthened by the fact that, according to the researches of Schilder, the precipitates obtained from normal urine, after treatment with lead chloride and ammonium hydrate, always respond to the phenylhydrazine reaction. It must be regretted that this delicate reaction for glucose is not easily applicable, as the determination of the melting-point of the compound formed is an absolute necessity, and, therefore, excludes a rapid examination of urine.

The statement is frequently made that temporary glycosuria is of little significance. The influence of food, muscular exercise, etc., are known to produce this effect. Individual tendencies are also known to vary under such conditions, and, if such influences are brought to bear upon certain subjects, a temporary glycosuria is of decided prognostic value.

The above deduction can be made from the statement of See, who

regards all individuals whose urine, one hour after the consumption of 150 grammes of wheat bread, shows an increased amount of inverted sugar, as future diabetics.

If this statement is correct, the presence of glucose in urine, under such conditions, is of more than passing importance.

Unfortunately, the detection of small amounts of glucose in urine is not an easy matter.

Other urine constituents interfere, and a test, absolutely trustworthy and easily applied, remains as yet to be found.

The medical and pharmaceutical press frequently publishes new, or modifications of old, sugar reactions, but on thorough trial most are found defective.

The copper reactions still appear to possess the confidence of most urine analysts, and a number of modifications have been suggested.

The fact that some coal-tar dyes in alkaline solution are changed to leuco-derivatives, colorless compounds in the presence of glucose, is taken advantage of in examining diabetic urine.

The two most prominent are Wender's methylene blue and Crissler's safranine tests.

The former has been stated to be affected by uric acid, and consequently cannot be regarded as possessing any advantage over Fehling's solution.

The rapid absorption of oxygen by the reduced liquid, tending to restore the original blue color, is another feature which detracts from the value of this test.

The Safranine Test.—Brief mention was made of this reaction in the January Pharmaceutical Meeting in connection with chrysophanic acid urine.

Safranine occurs in commerce as a brown powder, soluble in water and alcohol.

Technically it is used for dyeing cotton red, with a mordant of tannin and tartar-emetic.

It is stated that, on the addition of an alkali, safranine solution will not precipitate immediately, but, on standing some time, more or less precipitation will take place.

The test is applied as follows (reprinted from AM. JOUR. PHARM., Vol. 68, p. 94):

Equal measures of urine (2 c.c.), of normal NaOH or KOH solu-

tion and a solution of safranine, 1 part to 1,000 parts of water, are mixed.

The mixture is heated in a test tube, avoiding agitation as much as possible, till freely boiling. If the urine contains more than 0·1 per cent., the liquid is decolorized, otherwise the red color remains intact or is only partly destroyed. If the color is destroyed, the test may be repeated with twice or three times the volume of the safranine solution, each 2 c.c. of which roughly represents 0·1 per cent. of the glucose.

As stated, the test depends upon formation of a colorless leuco-derivative.

On diluting such a decolorized mixture, the red safranine color is again restored, also by vigorous agitation of the test tube in the the case of a small sugar percentage.

Albumin, by prolonged boiling, will also act like glucose, and must therefore be first removed.

The following statement accompanies the above directions:

Any discharge of color in the non-presence of albumin in the urine may be set down as being due to sugar.

The test is stated to remain unaffected by uric acid, creatine, creatinine, chloral, chloroform, hydrogen peroxide or salts of hydroxylamine.

The writer would extend this list to the following compounds, which were subjected to the safranine test in 10 per cent. aqueous solutions as follows:

Two cubic centimetres each of the solution, normal KOH solution, and the given strength safranine solution were heated to boiling in the usual manner. Acetone, antipyrine, chloral hydrate, potassium chlorate, tannin, gallic acid, pyrogallol, resorcin, hypophosphites, oxalates, salicylates, peptone of digestion, cane sugar, sodium phosphate, piperazine, slight action upon egg albumin.

REMARKS.

Acetone is not affected in subjecting it to the safranine test.

This is an advantage over Fehling's solution, the latter being slightly reduced.

With tannin, the safranine mixture turns very dark.

Milk sugar has the same action as glucose.

Action upon the Urinary Secretion.—Normal urine, when unaf-

fected by the safranine test, will not differ in its action when allowed to undergo ammoniacal decomposition.

In the examination of albuminous urine, the safranine mixture is in some instances decolorized only after prolonged boiling. The writer has, however, found in a number of instances that the urine, after complete separation of albumin by coagulation, will decolorize safranine solution as readily as the original urine.

As pointed out, peptone exerts no reducing action upon this test.

The fact that milk sugar behaves in a manner similar to glucose must be remembered, when examining the urine of nursing women.

Action upon Abnormal Urine.—As in the case of the copper tests, the question arises—does urine, passed after the administration of certain drugs, possess any action upon the safranine test?

If such should be the case, the result obtained must be regarded with as much conservatism as the reduction of Fehling's solution under like conditions.

To determine this, the writer subjected a number of specimens of urine, some apparently normal, and others which had been passed after internal administration of certain remedies, to the action of the safranine test.

He has found in almost every instance that, whenever Fehling's solution was strongly reduced by such specimens, the safranine test was also affected in a similar manner, to a greater or less degree.

The following is the result of an examination of forty-seven specimens of urine obtained from various sources.

Twelve specimens gave no reaction whatever. Most of these were normal, examined for insurance, which gave little or no reaction with Fehling's solution.

The other thirty-five specimens all reacted more or less to the safranine test.

Five samples had a diabetic history; one contained milk sugar.

Of the rest, the history was either not known or they were passed after the administration of certain drugs.

The administration of the following drugs was recorded:

Salol (6 cases), salicylates (7 cases), phenacetine (3 cases), oil of turpentine (3 cases), antipyrine (3 cases), creosote (5 cases), trional (1 case), piperazine (1 case).

Of the last-mentioned drug, one sample of urine was obtained, which did not respond to the safranine test.

From the above results, the deduction must be made that such urines, presumably glycuronic, affect the safranine as well as the copper test, acting like a small amount of glucose.

But the statement that any discharge of color by a sample of urine freed from albumin may be set down as being due to the presence of sugar, is not allowable in the case of such urines.

A suspicion of diabetes can, however, be entertained, if successive additions of the safranine solution are decolorized by the urine.

The question may be raised in these cases whether the reducing substance is a glycuronic compound or a small percentage of glucose.

In all doubtful cases, such urine was precipitated by basic lead acetate, the excess of lead removed by diluted sulphuric acid.

If glucose was present, the application to the filtrate of either the alkaline copper or the safranine test readily revealed its presence.

It may also be questioned if small quantities of glucose are not precipitated and removed by this treatment.

Various trials, made by the writer, showed that urine containing 0·1 per cent. of glucose can be subjected to the lead treatment and still reveal the presence in the filtrate to the copper or safranine tests.

Further dilutions, however, responded but feebly or entirely in the negative.

Milk sugar, substituted for glucose in these determinations, gave the same results.

For the quantitative estimation of sugar in diabetic urine, the safranine test does not give accurate results.

It has been stated that the discharge of color of each 2 c.c. of the safranine solution, 1 part to 1,000, corresponds roughly to 0·1 per cent. of sugar.

In working on this basis, the difficulty lies in determining the end of the reaction, when the mixture is required to assume the original red color before boiling.

In urine containing a large sugar percentage, dilution is necessary.

The writer has followed the practice of retaining a portion of the original mixture, and comparing with the boiled portion.

The fact that the end reaction, by the discharge of the blue color, can be readily observed forms one of the great advantages of Fehling's solution over the safranine test in quantitative estimations.

The Cupric Salicylate Test.—A number of modifications of the copper test have been proposed, the most recent of which is the following solution:

	Parts.
Cupric sulphate	2
Sodium salicylate cryst	2
Sodium carbonate	8

Distilled water, a sufficient quantity to make 100 parts.

The filtered solution has a dark green color, and the reducible constituent is stated to be cupric salicylate.

On boiling the liquid in a test tube, the precipitate formed is from gray to black, coating the sides of the tube.

If to 5 c.c. of this solution a few drops of diabetic urine are added and boiled, the precipitate will be dirty green.

On the further addition of urine, the precipitate will be of a yellow color.

The following directions are given:

Equal parts of the copper test liquid and urine are heated together to the boiling point, until a precipitate is formed.

If the same is gray or black, no sugar is present.

The writer subjected this test to a number of examinations, with a view of determining its delicacy, as well as its action upon certain glycuronic urines.

A number of specimens of normal urine, examined as directed, gave precipitates which varied in the shade of green.

The important point in this reaction seems to be in the appearance of a yellowish or yellowish-green tint in the liquid overlying the precipitate in the case of diabetic urine.

Urine containing ·25 per cent. of glucose will, if the proportions of urine and test liquid are as directed above, show a complete reduction by prolonged boiling.

Urine containing ·125 ($\frac{1}{8}$) per cent. of glucose will not completely reduce, but gives a yellowish-green supernatant liquid.

Samples containing ·063 ($\frac{1}{16}$) per cent. will not reduce the solution, and the color of the supernatant liquid will but slightly differ from that produced with perfectly normal urine.

The delicacy of the reaction may be placed between 0·1 per cent. and 0·125 per cent. of glucose.

Milk sugar reacts in the same manner as glucose, but the point of delicacy must be placed at a higher percentage point.

Reaction upon Glycuronic Urines.—An investigation was also made to determine the effect of urine passed after the administration of certain drugs upon this test.

Some specimens, such as creosote and salicylate urine, will, on boiling, assume a brown-black color, which, on dilution with water, show an almost complete absence of green.

The precipitate is, in such cases, gray or black.

It has, however, been observed by the writer that a subsequent addition of ·5 per cent. to 1 per cent. of glucose to such urine will give no evidence of reduction, the dark mixture obscuring the physical evidences.

A specimen of creasote urine, to which an addition of 0·5 per cent of glucose was made, gave, on boiling with an equal volume of the test liquid, a gray-black precipitate with a red-brown supernatant liquid. Comparison with the sugar-free sample, treated in a similar manner, showed no material physical variations.

The precipitation of Cu_2O in the saccharine sample was completely obscured.

Worm-Mueller's Modification of Fehling's Test.—The researches of several investigators have led to the determination of the various temperature points, at which the reduction of Fehling's solution takes place, when acted upon by other reducing urine constituents besides glucose. Those of primary importance are uric acid and creatinine.

Glucose reduces Fehling's solution at a temperature of from 60° to 70° C., the same being approximately the case also with milk sugar.

The reduction produced by uric acid is at this point feeble, the same taking place only at a temperature close to the boiling point.

In the case of creatinine, slight reduction is stated to take place between 60° and 70° C., but only completely between 90° and 100° C.

In normal urine its reducing power is, however, regarded as being insignificant.

These temperature variations are taken advantage of in the Worm-Mueller modification.

As given by the author, the test is applied as follows:

Solutions of cupric sulphate of 2·5 per cent., and of 10 per cent. of potassium and sodium tartrate in 4 per cent. NaOH or 5·6 per cent. KOH, are prepared. 1 c.c. of the copper solution is mixed with 2·5 c.c. of the alkaline Rochelle salt solution. 5 c.c. of the urine to be examined are employed.

Both liquids are heated at the same time to the boiling point, the boiling simultaneously interrupted, and after standing 20 to 25 seconds, no sooner, mixed and again allowed to stand.

The temperature of the liquids at the point of mixing is stated to be about 80° to 85° C., but will rapidly fall to 60° and lower.

According to the statement of the author, this procedure will produce the same effect as if the mixture is heated to 60° or 70° C.

If in 5 or 10 minutes no cuprous oxide is precipitated, the test is repeated with an increase of 0·5 c.c. of the copper solution, the alkaline mixture remaining as before. The copper solution may in this manner be increased until about 4 c.c. are taken.

If glucose is present, the oxide will be suspended throughout the liquid in the form of a dirty yellowish-green cloud.

A phosphate deposit, which may possibly obscure small amounts of the oxide, will soon sink to the bottom.

The author states that 0·025 per cent. of glucose may be detected in the urine by this method.

NOTES.

A. Jolles (see Proceedings of the A. Ph. A., 1895, p. 780) places the delicacy of this test at 0·08 per cent.

In a number of determinations the writer has obtained results which correspond with the statement of Worm-Mueller as to the percentage found.

But in several instances, while examining the urine of gouty patients or of those passed after the administration of piperazine, partial reduction of the test solution was found to take place.

As with Fehling's solution, this test is also affected by glycuronic urines.

After the administration of creosote or sodium salicylate, the

eliminated urine will turn the blue color of this test liquid to red.

In a case of sulphonal urine, a similar effect was also noticed.

As given by the author, this test is too tedious.

The writer employs freshly prepared Fehling's solution, following the direction of Worm-Mueller in the observation of time and other points.

5 c.c. each of Fehling's solution and of urine are taken.

If the urine contains 0·1 per cent. of glucose, the effects stated in the Worm-Mueller reaction will take place in less than one-half minute.

Urine containing 0·05 per cent. will deposit the oxide, when undiluted Fehling's solution is employed, on ten to fifteen minutes' standing.

With urine containing 0·025 per cent. of glucose, dilution of Fehling's solution is necessary.

On making the proportion 2 c.c. of the copper solution and 3 c.c. of water, taking 5 c.c. of the urine, the above sugar percentage in urine responds quite readily.

SOLID EXTRACTS AND THEIR STANDARDIZATION.[1]

By Charles H. LaWall.

With each succeeding revision of the United States Pharmacopœia since 1860 there has been a marked improvement in the various classes of Galenical preparations. The processes for the individual tinctures and fluid extracts have been subjected to criticism and subsequently altered when it was found necessary, so that, at the present time, an official process, when carefully adhered to in all of its details, will produce a satisfactory preparation.

It is particularly noticeable that the solid extracts have not shared, to any great extent, in the improvements of the past few decades, but that the same lack of uniformity exists at the present time as was formerly the case. The pharmacist of to-day, when he goes to the shelf for a jar of solid extract to aid him in compounding a prescription, is under the same disadvantage as formerly, in not certainly knowing whether he will be able to pour out the

[1] Read at the meeting of the Pennsylvania Pharmaceutical Association, June 16, 1896.

required quantity, or whether it will be necessary to use a hammer and a cold chisel to get it out of the jar. The definition *pilular consistence* is now, and always will be, subject to as many different interpretations as there are pharmacists. This difficulty (which will never be entirely overcome) is of minor importance to the real one, *i. e.*, the lack of uniformity in strength, when compared with the drug itself. This has been referred to frequently, but has not yet been remedied.

It is a matter of grave importance when we realize that the quantity of extractive matter obtained from a drug bears no definite ratio to the percentage of its active constituents or to its medicinal efficacy, but is influenced almost solely by the degree of dilution of the alcoholic menstruum employed in the percolation of the drug. An unscrupulous manufacturer can obtain twice as much solid extract from a given drug as one who works according to the Pharmacopœia. His profits, therefore, are doubly great, and it matters little to him that his preparation is deficient in medicinal value, since there is no standard to which his product must conform.

Among the leading manufacturers of the present time the watchword is standardization, and, by its aid, is being developed a uniformity in many preparations even when made from drugs of varying quality. There has been much said both for and against this movement, but its opponents are few, and by this time must realize that it is neither an advertisement nor a fad, but is the natural outcome of the evolutionary forces that have long been at work in the science of practical pharmacy, and, in the cases of opium, cinchona and nux vomica, there are requirements in the present Pharmacopœia both for the drugs and some of the preparations made from them. Since the last revision of that important work, however, many additional drugs have been investigated, and, at the meeting of the American Pharmaceutical Association in 1895, the Committee on the Revision of the Pharmacopœia recommended that standards and processes of assay be adopted also for coca leaves, hydrastis and pilocarpus.

If convenient and appropriate standards be adopted for the solid extracts of such drugs as have principles which are easily estimated, the remaining difficulty would only consist in the preservation of the extracts so as to retain the consistence which they possessed at the time of manufacture. When about 4 or 5 per cent. of glycerin

is added to the nearly finished extract, it suffers but slight alteration in consistence even when kept for several years; of course, it must be kept tightly covered, probably one-half of the deterioration of solid extracts being due to neglect of this precaution, in which case loss of moisture causes the extract to become hard and brittle and produces a corresponding alteration in strength.

A list has been prepared of the average yield of solid extract obtained in actual practice from those official drugs to which standardization might easily be applied; to this has been added, in each case, the average percentage of alkaloid present in the drug, and the standard to which the solid extract should conform in alkaloidal content.

Extracts.	Average Per Cent. of Extract Obtained.	Average Per Cent. of Alkaloid Present in the Drug.	Percentage of Alkaloid Required in a Solid Extract of Standard Strength.
Aconite root	19	0·50	2·50
Belladonna leaves, alcoholic	20	0·40	2·00
Cinchona	26	2·50[1]	10·00[1]
Colchicum root	25	0·50	2·00
Conium	28	0·50	1·75
Hyoscyamus	20	0·18	0·90
Physostigma	5	0.20	4·00
Stramonium seed	20	0·35	1·75
Nux vomica	Standard has already been adopted.		
Opium	Standard has already been adopted.		

[1] Percentage of quinine.

In aconite root the percentage of extractive, when compared with the average alkaloidal content of the drug, shows that the extract should contain about 2·50 per cent. of aconitine, estimated gravimetrically.

Extract of belladonna leaves (alcoholic) represents about five times its weight of the drug and contains about 2·00 per cent. of alkaloid, estimated gravimetrically.

Cinchona contains about 25 per cent. of extractive matter, and should, therefore, assay about 20 per cent. of total alkaloids, one-half of which should be quinine.

Colchicum root yields about 25 per cent. of extract, which should assay about 2·00 per cent. of alkaloid.

Conium fruit yields nearly 30 per cent. of extract, which should contain about 1·75 per cent. alkaloid.

Hyoscyamus contains about 20 per cent. of extract, which should yield about 0·90 per cent. of alkaloid, estimated gravimetrically.

Physostigma yields but 5 per cent. of extractive matter, which corresponds to 4·00 per cent. of ether-soluble alkaloid.

Stramonium seed contains about 20 per cent. of extractive matter, corresponding to about 1·75 per cent. of alkaloid.

The author has obtained very favorable results in practice, with the above data, in the cases of several of the drugs just enumerated.

In the *Bulletin of Pharmacy*, 1895, page 202, Professor J. B. Nagelvoort published an excellent article, in which he considered the subject of standardization from a business standpoint. In this paper, Prof. Nagelvoort objects to the use of glucose in solid extracts, and suggests the use of extract of taraxacum as a diluent for those extracts which are considerably over the standard in strength, and he also gives several examples of practical results working with belladonna leaves of varying quality. Extract of licorice and extract of gentian have also been mentioned for use in diluting, being of comparatively low cost, and practically inert. The use of gentian might be objected to upon the ground of its strong, bitter taste, which would mask the characteristic taste of most drugs, and render identification difficult. Another method, which the author would like to suggest for further experimenting on this subject, is as follows:

Percolate a portion of the drug with a menstruum about 5 or 10 per cent. lower in alcoholic strength. This will in most cases ensure a larger yield of extract, of correspondingly lower strength. This preparation could be kept on hand and used as required in cases where dilution becomes necessary. By this method no principles

foreign to the drug are introduced, and it becomes a simple problem for calculation in order to ascertain the proportions of the weaker and the stronger extracts to be mixed to produce an extract of standard strength.

In the case of some solid extracts (such as belladonna) which contain a large amount of chlorophyll, the difficulty is often experienced of having that substance separate out in lumps or clots as the extract nears completion. It can rarely, if ever, be thoroughly incorporated so as to make a perfectly homogeneous extract; and while it is possible to remove this separated chlorophyll without impairing the medicinal activity of the preparation, the extract does not then possess the color which is characteristic to it, and, in the case of extract of belladonna, resembles the preparation made from the root rather than that made from the leaf.

This difficulty can only be obviated with certainty by evaporating the percolate from the drug under reduced pressure with continuous stirring, which is impracticable for manufacturers of small quantities.

The powdered extracts may be made to conform to fixed standards in the same manner as the solid extracts, and present indications show that but a short time will elapse until standardized extracts, both solid and powdered, will be the rule rather than the exception.

Changes of a radical nature must necessarily be slow in order to be effective. The introduction of the class of preparations known as abstracts into the 1880 Pharmacopœia was too abrupt. They were but little used, and were dismissed from the last revision of that work. This was not due to lack of efficiency in any respect, for their uniformity rendered them preferable to the powdered extracts, which they closely resembled, and the use of which they did not seem to influence in the least; yet, if but one or two of the more important abstracts had been admitted at first, it might have paved the way for the permanent introduction of one of the most desirable classes of preparations the Pharmacopœia has ever contained.

A list is given below of the yield of solid extract obtained from a number of drugs, both official and otherwise, working upon a large scale in practice. These figures may serve as additional data for other workers in the same line, and the author hopes that the subject of the standardization of the solid extracts will be given

careful consideration by all who are interested in the scientific progress of practical pharmacy.

Drug.	Per Cent. of Extract Obtained.	Drug.	Per Cent. of Extract Obtained.
Cannabis indica	13	Buchu	14
Cimicifuga	30	Cornus florida	7
Digitalis	20	Fucus vesiculosus	26
Ergot	14	Cubeb	20
Gentian	35	Colchicum seed	16
Licorice, purified	55	Damiana	11
Jalap	27	Ignatia amara	19
Juglans	12	Sumbul	28
Leptandra	27	Rumex	40
Quassia	3·5	Viburnum prun.	15
Rhubarb	30	Senega	46
Taraxacum	35	Cotton-root bark	10
Uva ursi	30	Calumba	17
Logwood	5	Valerian	20
Xanthoxylum	6	Viburnum opulus	23
Gelsemium	10	Scutellaria	35
Conium leaf	30	Calendula	30
Hamamelis	25	Jaborandi	25
Triticum	18	Grindelia robusta	20
Kava Kava	7	Colchicum (acetic)	25
Pulsatilla	24	Scoparius	17
Serpentaria	10	Rubus	25
Chirata	15	Salvia	25

305 Cherry Street, Philadelphia, Pa.

THE EXAMINATION OF POWDERED GAMBOGE.[1]

By E. G. Eberhardt.

In the last revision of the Pharmacopœia and also in the preceding one, under the heading "Cambogia," there follows, after the description of general properties, this statement: "Boiled with water, gamboge yields a liquid which, after cooling, does not become green with iodine T. S. (absence of starch)." This test is sufficiently delicate to disclose the presence of considerably less than 1 per cent. of starch, and although good pipe gamboge will generally meet this requirement, an experience extending over several years has failed to discover a powdered gum that would do the same. There always seems to be present in the latter a small amount—1

[1] Read at the meeting of the Indiana Pharmaceutical Association, June 3, 1896.

per cent. and less—of starch, a quantity too small to be classed as an adulteration, and yet too large to be justified by the Pharmacopœia. This authority recognizes and describes only pipe gamboge, but by far the larger number of druggists buy and use the powder. So it happens that the officially described article is not the one in general use.

How this trace of starch finds its way into the drug we have not been able to determine. A well-known firm of New York drug millers being asked about the matter replied that their gamboge was powdered from block or mass and broken pipes, upon their own premises, under their own supervision, and was strictly pure. The only explanation they could offer for the presence of starch was that block or mass gamboge was moulded in forms made from, or lined with, rice straw, of which a very little becomes mixed with the gum, and certain qualities are occasionally mentioned in London market reports as blocky, broken and ricey. They state, however, that they have never observed the latter in the American market.

Another possible explanation is that the mills used in grinding contained remnants of some starchy drug, and were not thoroughly cleaned before being used upon gamboge. However this may be, it is certain that a trace of starch should not condemn a drug otherwise pure, and if a starch-test is applied, it should be of such a nature as to distinguish between small and excessive amounts. Far better it would be to require the presence of from 75 to 80 per cent. of resin, as this is the active and valuable portion.

In order to ascertain approximately how much starch powdered gamboge contains, a convenient quantity was exhausted with ether, the small amount of residue dissolved in hot water and cooled, when, upon adding a drop of iodine solution, a faint blue color developed, showing the presence of only traces of starch. This same sample gave a distinct green color under the conditions of the official test.

Gamboge resin (cambogic acid) dissolves completely in solutions of the caustic alkalies, and is precipitated apparently unchanged upon the addition of excess of acid. Starch also dissolves in solution of caustic alkali. Such solution, when acidulated with hydrochloric acid, shows cloudiness, but no perceptible precipitate. If this acidulated liquid is filtered through paper, the filtered liquid gives no reaction for starch, but if simply strained through absorbent cotton, the

liquid collected will contain an abundance of starch. Upon these facts the following test is based: in 5 c.c. of potassa solution, 1 gm. of powdered gamboge is dissolved with stirring; then 45 c.c. of distilled water are added, and lastly an excess of hydrochloric acid, the whole being stirred until uniformly of a bright yellow color. The thin magma so obtained is poured upon a pellet of absorbent cotton loosely inserted into the neck of a small funnel. The almost colorless liquid which drains off is tested with a drop or two of iodine solution. If starch is present in quantities larger than 2 per cent., a dark blue color or precipitate is immediately produced.

Commercial powdered gamboge generally gives a greenish tinge, gradually developing a faint blue color.

Pure gamboge, with 1 per cent. of starch or flour, gives a faint blue, becoming darker on standing and depositing a slight precipitate.

Two per cent. of starch gives immediately a decided blue, and, on standing a few hours, some precipitate.

Five and ten per cent. of starch give almost immediately decided precipitates of iodide of starch.

Five per cent. and less of curcuma gives pronounced starch reactions.

Any powdered gamboge which, by this test, gives immediately a dark blue color or precipitate, should be looked upon with suspicion. But even if the drug were perfectly free from starch, it might still be grossly adulterated. So the only criterion of its value is the presence of the proper amount of resin. What the remainder consists of is medicinally of no importance, so long as it is inert.

In the short table following, is given the amount of resin and residue obtained from several varieties of gamboge by treatment with alcohol. Moisture was not estimated, the material being taken in the air-dry condition:

Sample.	Pipe No. 1.	Pipe No. 2.	Pipe No. 3.	Powdered.
Residue	21·1	23·46	24·1	18·6
Resin	78·9	76·54	75·9	81·4
Starch	none	none	none	trace

The starch test, as above applied, can be used with advantage in the examination of other powdered drugs, straining being resorted to only where there is an insoluble portion or a precipitate which interferes with observation of color.

In conclusion, I would recommend that the next revision of the U. S. Pharmacopœia require that from 75 per cent. to 80 per cent. of gamboge be soluble in alcohol, and also if a test be given for starch, that it be capable of distinguishing between traces and appreciable quantities of that substance.

INDIANAPOLIS, IND., June, 1896.

ON THE IDENTIFICATION OF MORPHINE IN TOXICOLOGICAL CASES.

BY J. B. NAGELVOORT.

I. It is not generally believed that many alkaloids are far more stable than they are said to be.

For obvious reasons, morphine has been selected as an example of stability under unfavorable conditions for its existence. There are not so many alkaloids to which the laymen—the public in general—have access. Morphine is one of the few usually employed to commit suicide or murder. Suicide may become important for the analytical chemist to decide upon, if a life insurance policy is involved.

Not so very long ago, Prof. David L. Davoll, Jr., of the University of Michigan, reported negative results of a research as to certain morphine reactions to be obtained from ptomaines (*Journal of the American Chemical Society*, Vol. XVI, No. 12, 1894, "Fallacies of Post-Mortem Tests for Morphine"). An investigation closely connected with positive identifications of morphine in toxicological cases.

> Strychnine is a very stable alkaloid. It has been found from seven to ten months after burial. Compare Blythe, "Poisons," 1895, p. 325; W. A. Noyes, in *Journal of the American Chemical Society*, 1894, p. 108.
>
> Coniine was found by Otto to resist decomposition far longer than one would incline to presume. It was positively identified in a body in a high state of putrefaction, in one case in three and one-half months, in another between four and five months. (Otto, "Ausmittelung der Gifte," 1892, p. 110.)
>
> Nicotine was found after being exposed three months to putrefying influences. (*Ante*, p. 110.)

II. The quintessence of the following lines could be written in these two sentences:

A. Morphine has been repeatedly recovered from putrefying animal matter, after fifty days' exposure to the

highly complicated action of decomposition of an animal body.

B. Tamba's experiments, that ptomaines have not any deleterious effects upon the most characteristic morphine reactions, have been fully verified. (See IV, V, VIII.)

It is, however, desirable to epitomize some notes on this subject, since the conditions requiring a sound judgment, as well as self-consciousness and ability, are seldom of greater importance than where chemical reactions have to be applied in toxicological cases. A misunderstanding of a fact or of an occurrence of any kind, lack of reasoning, lack of honesty of purpose, sometimes, may jeopardize life, liberty and the good name of any citizen.

I learn at the time that this paper is going to press that ex-Coroners *Butler* and *Bettinger*, with their two clerks, *Bird* and *Benbing*, were each sentenced to eighteen months in the House of Correction in Detroit, Mich. The quartet were convicted of conspiring to defraud the county by submitting bills for inquests which never took place.

A certain Mrs. E. McDermoth died from poisoning—was stated elsewhere. The county physician "found" traces of poison, **probably** morphine.

Conjectures and suppositions instead of observations of facts.

Another county physician reported: The potion given the baby was a tincture of opium; the custom is to shake before using, but in this instance (a poisoning by morphine) that was neglected. The drug rose to the top.

All of this testimony was paid for and no questions asked.

I refer the reader to an article in the *Bulletin of Pharmacy* for January, 1895, "le Chimiste malgré lui," where it is advocated that the pharmaceutical or analytical chemist, with a well-conducted laboratory, is the proper man in the proper place, in a toxicological case, *versus* the annual or biennial county physician, with hardly any laboratory practice.

III. It will be seen at once how important a field of labor this is, and how desirable to have all the positive evidence of our ability to recover morphine from putrefying animal matter, placed on record.

The consequence of the presence of ptomaines, in this line of work, must not be overestimated. Ogier and Ilinovici found that none of the ptomaines, isolated by ethyl ether or chloroform from a putrefied cadaver, gave the blue color reaction with ferric chloride, as morphine does. ("Real Encyclopædia der Pharmacie." By Geissler and Moeller, VIII, p. 387.) Graebener states that such characteristic reactions as we possess for morphine will succeed even in the presence of ptomaines. (Dragendorff, Ermittelung von

Gifte, 1895, p. 166.) Under a great variety of conditions I have found this to be a correct and exact observation. Special attention is therefore called, first, to the purple color reaction obtained (described below) with a freshly prepared solution of sulphomolybdate of ammonia (Fröhde's reagent); ptomaines, Dragendorff says, usually give a brown or greenish-brown color reaction; second, to the blue color reaction obtained with a dilute ferric chloride solution; third, to the blood-red color reaction obtained from the combined action of sulphuric and nitric acids, as directed in Husemann's test.

IV. Kobert states distinctly that morphine is stable in cadavers **for a few weeks.** ("Dass das Morphin sich in Leichen einige Wochen lang halten kann, ist sicher; p. 565, Lehrbuch der Intoxikationen, 1895.)

Barillot writes equally emphatically. ("La morphine résiste bien à la putréfaction; on a pu la caractériser après quelques semaines de mélange avec des matières putréfies. Barillot, Traité de Chimie légale, p. 185, 1894").

Dragendorff states: "Most of the alkaloids are more stable than is usually believed. (Dragendorff, Ermittelung von Gifte, 1895, p. 142.) Davoll's results deserve notice. This author says: "After ten days' standing in the open air and in a warm place, I recovered about 50 per cent. of the morphine added to a putrid liver;" while in his further experiment, on the isolation of ptomaines from the cadaver of a dog, no morphine reactions were obtained, or, in other words, there were no ptomaines present in the final purified product, obtained as in a usual method of analysis, capable of giving fallacious tests.

I desired to insert an excerpt of the Buchanan *case celèbre*, which was tried in New York in 1893 or 1894, but have been unsuccessful to find a report of the chemist in the case. The *New York Supplement*, Vol. 25, 1894, contains, on page 481, only a legal report. So does the *N. Y. Reporter*, Vol. 40, 1895, p. 883.

V. A practical test seems to be needed to determine how small a quantity of morphine can be isolated and identified; the sensitiveness of morphine to different reagents being well known, 1/8 grain was taken, the smallest quantity a layman could give. This was dissolved in a plate of soup. Soup was selected because I wanted to imitate volume and contents of a human stomach in natural condition.

The next step was to mix 0·050 gramme morphine with a suitable portion of refuse from a restaurant—meat, fat and some bulk of vegetable matter. Ten mixtures of this kind were left to putrefy in my laboratory for fifty days, in a warm room, covered with a glass jar. Three mixtures of the same quantity of morphine with human flesh, furnished by the medical school, were also left to putrefy. Morphine was used, and not the sulphate or the hydrochlorate, because there was plenty of the alkaloid on hand in the laboratory from previous opium assays, and it answered just as well. To one portion of human flesh (lungs, heart, stomach, liver) I added three grains of morphine sulphate from a drug store.

It was desirable, Prof. Charles A. Doremus states, in his "Chemical History of a Case of Combined Antimonial and Arsenical Poisoning" (*Journal of the American Chemical Society*, September, 1895, pages 672, 673), to ascertain if the ptomaines present might either give or mask the morphine reactions. Morphine had been prescribed. The morphine reactions were not obtainable; some of the ptomaine reactions were pronounced. Minute quantities of morphine solutions added to portions of the residues could be detected by appropriate tests.

VI. At the end of the fifty days' exposure morphine was searched for in all the mixtures by my scholars and myself by the methods of Dragendorff, of Stas-Otto and of Graham (the dialysation process), due precautions being taken against confusion in the chemical reactions. Ptomaines (or ptomatines, as it is proposed we should write more grammatically) being removed by washing the aqueous acid and the aqueous alkaline fluid respectively with ethyl ether, at summer room temperature, and with a mixture of 4 volumes of ethyl ether and 1 volume of chloroform,

as long as those solvents removed substances, giving alkaloidal reactions, precipitates, with a solution of iodine in potassium iodide and with mercurio-potassium iodide solution,

the latter solution always added to an acidulated aqueous portion.

Isobutylic alcohol is substituted for amylic alcohol in the different processes, only to avoid the bad effect of the latter on the operator (headache); otherwise it has no advantage.

VII. One case is conducted according to Kippenberger's method.

To one-third part of the human flesh, to which 3 grains of morphine sulphate, obtained in a drug store, was added, and which was kept in a dark closet, covered with a glass jar, and this again covered with earth, to putrefy—q. s. glycerin of 1·25 sp.

gr., containing 10 per cent. tannin, was added, and the whole digested two days, at 40° C., frequently stirring. The mass was strained; the residue washed with a fresh quantity of glycerin, containing 10 per cent. tannin; again strained; this operation was repeated for a third time. The combined glycerin extracts were heated to 50° C., cooled, and diluted with an equal volume of water. In an experimental way I found that this dilution was a necessity or petroleum ether would not separate clearly. Washed with petroleum ether (boiling point, 50°). Repeated this twice. Removed petroleum ether. Warmed glycerin extract, to expel traces of petroleum ether. Cooled. Washed (the extract being acid) with chloroform, removed chloroform. Now added chloroform, containing 10 per cent. alcohol. Made alkaline with NaOH. Added $NaHCO_3$. Agitated. Collected the chloroform. Evaporated it. It left a color and odorless residue, proving the excellence or superiority of this method as compared with the older ones. (Kippenberger, Beiträge zur Reinisolirung, quant. Trennung u. chem. Characteristik v. Alkaloïden u. glycosidartigen Körpern, in forensen Fällen. Wiesbaden. C. W. Kreidel. 1895.)

VIII. Good results of the methods of Dragendorff, Stas-Otto, Graham and Kippenberger, above referred to.

Applied the sulphomolybdate test (Fröhde's); obtained a most positive, decided and strong morphine reaction. The purple color appeared immediately.

Applied the ferric chloride test. One drop of the ferric chloride solution added to a residue of evaporation of a portion of the isobutylic alcohol caused the characteristic blue color reaction.

Applied the H_2SO_4 and HNO_3 test (Husemann's). A very distinct blood-red color appeared, where the glass rod, previously moistened with HNO_3, touched the H_2SO_4.

Applied the KIO_3 test. The previously colorless mixture of KIO_3, acetic acid and water became immediately brownish-yellow, upon the addition to the mixture of the solution in acetic acid of a residue of evaporation of another portion of isobutylic alcohol.

After all these satisfactory tests, half of the isobutylic alcohol, that was left, *being colorless*, was evaporated. Left a bad-smelling, amorphous residue. *A.* (Proof for the accuracy of Tamba's and Graebener's statements.) This residue was heated for an hour to 100° C.; taken up with a small quantity of acidulated water,

whereby most of it was left undissolved. It had the appearance of coagulated albumen. *B.* Decanted. Added q. s. ethyl ether, ammonia to slight excess, and left it to itself for five days, to see if morphine would crystallize out.

This experiment failed. No crystals were obtained.

IX. The fluid used to experiment upon, if morphine could be obtained in the crystalline state, was evaporated to dryness. The presence of morphine in the residue was again verified by Fröhde's and Husemann's tests. Herein lays another evidence for the separation of ptomaine-like bodies and morphine, as well as for Kippenberger's opinion, that much of what is described in our literature as "cadaver alkaloid," and as answering to general group reactions on alkaloids, is a mixture of peptones and albuminates. (See VIII, *A* and *B.*)

Conclusion.—No better conclusion can be drawn than a statement that a popular belief in the destructive power for alkaloids, of the decomposition of cadavers, has no foundation in the facts.

N. W. University,
School of Pharmacy, May, 1896.

THE MAKING OF AN HERBARIUM.[1]

By Clement B. Lowe.

A series of practical suggestions are wanted as to the best method of collecting, identifying and preserving plants for making an herbarium.

In answering the above query, I would state that it is a pity that more pharmacists are not interested in field botany, as, aside from the valuable information thus to be obtained, the collection of plants is a healthful occupation, and tends to give the outdoor exercise which so many of them need.

In collecting plants a suitable receptacle for containing them is necessary, which should be as nearly air-tight as possible, so that the contents can be kept fresh for several days. A japanned tin box, about 17 inches long by 7 inches wide and 4 inches deep, with a lid opening nearly the length of the flat side, suspended from the shoulder by a strap, will answer the purpose well.

Many prefer to take a stout portfolio, either hinged on one side or

[1] Read before the Pennsylvania Pharmaceutical Association, at Mt. Holly Springs, June 17, 1896.

fastened on both sides by straps, containing numerous sheets of absorbent paper, and transfer the plants directly to it, as by so doing any injury to the plants is avoided and the whole can be transferred directly to the press on reaching home.

A knife or trowel for digging is of great use; the best is probably a trowel, in which the V-shaped grooved blade is driven directly into the handle. Professor Maisch used to carry a convenient cane, with a nickel-plated handle, shaped like a narrow grubbing hoe.

In collecting plants, care should be taken to collect those which are typical of the species, and yet variations from the typical form are also instructive and can be mounted by their side.

We always desire to obtain the inflorescence, and frequently also the fruit, as in some cases the latter is quite as, or more, important than the flowers, as in the case of the Umbelliferæ, where the distinction between the genera is based largely upon the fruit.

In the case of many plants, the radical (root) leaves should be gathered, as they are more characteristic than those growing upon the stem; *e. g.*, Shepherd's Purse has the root leaves clustered, and pinnatifid or toothed, while the stem leaves are arrow-shaped and sessile.

The root or rhizome should generally be gathered, as in a number of cases it is the official part of the plant, and it frequently has prominent characteristics; in the case of rare plants it is best not to do so, as some herbaceous perennials, like Senega, have in this way been almost exterminated.

There is often quite a choice as to where your botanical excursion shall be made, different regions showing different floras. Those living in the neighborhood of Philadelphia will find quite a difference between the floras of Pennsylvania and New Jersey, and no herbarium of this region would be complete without representatives from both localities.

After the plants are collected, the next step is their examination and the identification of unknown species. To do this successfully, one should have a sharp penknife, pair of dissecting needles, pair of pincettes and a dissecting microscope, the best of the latter being one which has immovable hand-rests, like Barnes', although Sayre's dissecting microscope, while not so convenient in the laboratory, can be used in the field as well.

In the examination of an unknown plant, the height, shape and epidermis of the stem should be considered, and whether endogenous or exogenous, although in most cases the venation of the leaves will show the latter just as well. The leaves should be examined as to phyllotaxy, venation, shape and size. The flowers should be examined as to the parts present, their size, shape, color, union, insertion, etc., and then vertical and transverse sections should be made, notes being made of the different observations.

When this has been done, the name can in most cases be speedily determined by means of the analytical key in the front of "Gray's Manual of Botany."

Beginners will find it easier to analyze regular flowers of fair size, such as the Corn Cockle (Lychnis Githago), which is frequently found in wheat fields, to the annoyance of the farmers; or what is still better is for the first times to take known flowers, like the apple blossom or wild rose, find the description in the "Manual," and compare it carefully. After this has been done a number of times they will be better able to proceed with unknown flowers.

Those with but little knowledge of botany will find Mrs. Dana's "How to Know the Wild Flowers," in which they are classified according to color, and many of them illustrated, an interesting book, while if they desire to increase their knowledge, they will find Professor Bastin's "Laboratory Exercises in Botany" a most valuable work. Gray's "School and Field Botany" (Revised Edition) is also an excellent work, not so technical as the "Manual," and it includes many of the cultivated as well as wild flowers.

The next step is the preservation of the specimens. They should be dried between sheets of absorbent paper, with heavier sheets occasionally interspersed, sufficient pressure being made by means of weighted boards.

Perhaps a better arrangement for drying is to use for top and bottom an open frame or lattice work, each frame consisting of two layers of half-inch strips crossing each other at right angles, having a hook in the end of each strip. The sheets of drying paper are laid between the frames, and the proper pressure is made by means of a stout cord passing around the hooks, the whole being hung where there is a current of air.

In the case of hollow leaves like the Sarracenia (Pitcher plants), or flowers like Cypripedium acaule (Stemless Lady's Slipper), ab-

sorbent cotton should be placed in them to facilitate drying, and to preserve their outlines.

Specimens should be dried as rapidly as possible, to preserve their color and general appearance, and the driers should be changed every day for five days; still better results will be obtained by changing them two or three times during the first twenty-four hours.

According to Schroeder (AMER. JOUR. PHARM., 1896, p. 132), heavy gray felt paper, saturated with a 3 per cent. solution of oxalic acid and allowed to dry, will preserve unchanged the color of the petals, and in most cases the green of the leaves.

When the plants are thoroughly dried they should be poisoned by applying a nearly saturated solution of corrosive sublimate with a soft brush, the plants being laid upon a flat dish, and afterwards placed between driers until the alcohol evaporates.

Then follows the mounting of the specimens. Sheets of white paper, 11½ x 17½ inches, about 30 pounds to the ream of 480 sheets, are best for this purpose. They should be fastened to the sheets either by narrow strips of isinglass plaster, or better, directly by means of a liquid glue like Le Page's.

To the right-hand lower corner of each sheet should be affixed a label, something like the following, which, for the purpose of illustration, is written out as it would be if affixed to the plant Chelidonium:

> Herbarium, C. B. Lowe.
> Bot. Name, Chelidonium majus.
> Synonym, Celandine.
> N. O., Papaveraceæ.
> Locality, Tulpehocken, 4/22/'96.

Each specimen or all of the same species may be enclosed in a sheet of white paper of less weight than that upon which they are mounted.

All of the species of the same genus should be then enclosed in a genus cover of heavy manilla paper.

The name of the genus, with that of the natural order, should be written in a large hand upon the lower left-hand corner of the cover next the back. The name of the enclosed species can be written upon the lower right-hand corner. The genera can also be numbered according to "Gray's Manual."

The herbarium should be preserved in a suitable receptacle, free from dust. This may consist of a cabinet, with shelves of the proper width and depth for the genus covers to slide in easily, or of a number of plain boxes with shelves 4 or 6 inches apart and doors which shut flush. The names of the orders can be pasted upon the shelves or affixed to the edge of the genus board, which contains a list of the genera of the order, and is inserted at its beginning.

A CONTRIBUTION TO THE KNOWLEDGE OF SOME NORTH AMERICAN CONIFERÆ.

By Edson S. Bastin and Henry Trimble.

(*Continued from page 337.*)

THE GENERAL CHARACTERS OF THE SPRUCES.

The important genus Picea numbers about a dozen species, all inhabiting the mountainous regions of the North. Two of them are native to the Northeastern United States, three to our Northwest, two are European and five are Asiatic. They are straight-boled, evergreen trees, of pyramidal form and rather slow growth; whitish, soft, close-grained and somewhat resinous wood; alternate, acicular, tetragonal leaves, which are very numerous and compactly arranged on the younger branches, and seldom exceed an inch in length.

The leaves are sessile and the persistent bases prominent, giving a rough appearance to the branches. The tetragonal form of the leaf is due to the fact that both the upper and the lower surfaces are keeled. Stomata usually occur in rows on all four faces; but, frequently, the rows are less numerous on the two faces of the lower surface. Internally, the leaves show a central stele, containing a small, usually distinctly double, collateral fibro-vascular bundle, surrounded by a more or less copious transfusion tissue, similar to that of the pines. The stele is separated from the mesophyll by a distinct endodermis. The mesophyll is composed of parenchyma, which has wavy, but not folded, walls. The epidermis is supported by a hypoderma, usually one-, but sometimes more than one-layered. Elongated oil tubes occur at the lateral angles of the leaves, but are frequently not continuous from end to end, so that a cross-section often shows but one or none. The staminate flowers are axillary, or sometimes terminal, on the branchlets of the preceding year,

cylindrical or oblong, short-stalked and scaly at the base; the connective of the anthers is prolonged to form a rounded, erect crest; the two pollen sacs dehisce longitudinally. The pistillate flowers

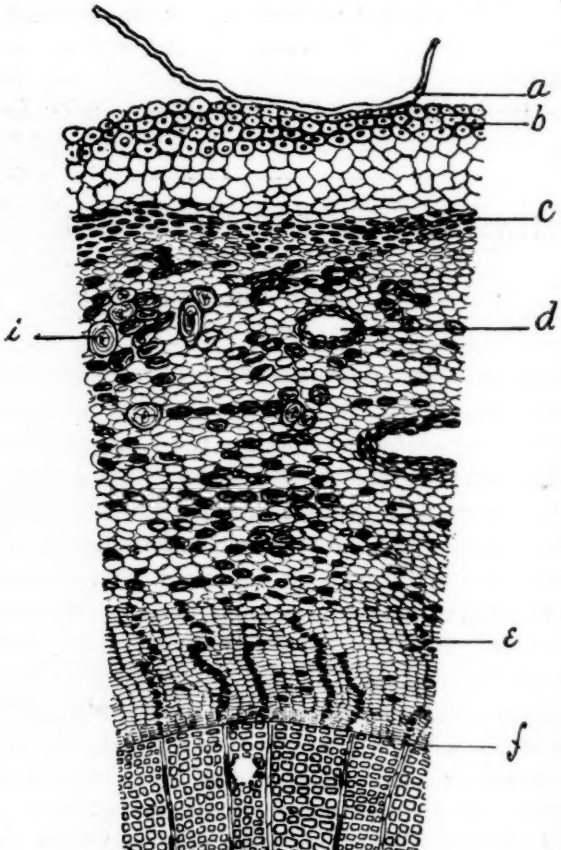

Fig. 38, from cross-section of stem of Picea alba, magnified 75 diameters. *A*, cuticle; *b*, hypoderma; *c*, periderm; *d*, secretion reservoir; *e*, tannin cells in bast; *f*, cambium; *g*, ring of growth; *h*, secretion reservoir in wood; *i*, stone-cell.

are terminal, the fertile scales much exceeding the bracts; the cones are pendulous, maturing the first year; the seeds are winged, and the embryo has from four to eight cotyledons.

PICEA ALBA, LINK.

WHITE OR SINGLE SPRUCE.

This species occupies the northern portion of our continent from Newfoundland, through Labrador, the Hudson's Bay region, mouth of the Mackenzie River, and the Valley of the Yukon. It occurs also in northern Maine, northern New Hampshire, northern Vermont, northern New York, Canada, northern Michigan, northern

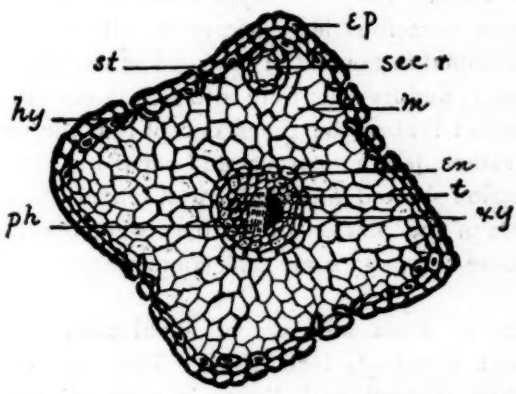

Fig. 39, cross-section of leaf of Picea alba, magnified 75 diameters. *Ep*, epidermis; *hy*, hypoderma; *st*, stoma; *sec. r*, secretion reservoir for oleoresin; *m*, mesophyll cell; *en*, endodermis; *t*, transfusion tissue; *xy*, xylem of bundle; *ph*, phloem.

Wisconsin, north shore of Lake Superior, northern Minnesota, the Black Hills of Dakota, Montana and British Columbia. The tree, under favorable conditions, attains a height of 150 feet or more, and a diameter at its base of 2 or 3 feet, but in the eastern portion of the United States it is usually smaller, seldom reaching a height of 100 feet. It favors damp soil, the borders of streams and lakes, and swampy regions. Its general aspect is lighter than that of any other species of its genus, its leaves being glaucous, its twigs smooth and light-colored, and its bark lighter than that of the other species. Its cones are oblong-cylindrical, pendulous and lax, and its scales thin and entire-margined. The length of the cones varies

from 1¾ to 2½ inches, and the thickness from ⅝ inch to ¾ inch. The color of the cones is light brown.

MICROSCOPICAL STRUCTURE.

A cross-section of a twig of two years' growth showed the following structure: The thick-walled epidermal cells were supported by two or three layers of thick-walled fibres. Beneath this was a large-celled, thin-walled parenchyma, consisting of several layers of cells. This was succeeded internally by bands of periderm, composed in part of stone cells, and in part of thin-walled cells containing much tannin. Interior to these was a copious parenchyma, containing numerous scattered tannin cells and some secretion reservoirs for oleoresin. The bast layer contained no lignified fibres, and there were numerous large secretion cells containing tannin; these were arranged in tangential rows. The medullary rays of this layer were wavy, and its cells were also rich in tannin. The xylem closely resembled that of the pines, except that the secretion reservoirs were rather less numerous and smaller. A longitudinal-tangential section showed medullary rays, longer and more numerous than those of the pines. In the bark were observed scattered clusters of stone cells, and some cells containing crystals of calcium oxalate.

The leaves of Picea alba are of small size, from ½ to ¾ inch long and about $\frac{1}{50}$ inch thick. They are quadrangular-prismatic, sharp-pointed, and have on each of the four sides two or three more or less interrupted rows of stomata. The secretion reservoirs at the lateral angles are of small size. The epidermis has the outer walls of its cells thick and strongly cutinized; the lateral and inner ones much less thickened. The hypoderma is composed of one layer of cells, some of them with thin walls, others with thick ones. The mesophyll is composed of wavy-walled cells. The fibro-vascular bundle is thin and has, at the upper margin of the phloem, a few thick-walled fibres. The transfusion tissue is few-layered, and the endodermis distinct and composed of cells having their radial walls somewhat thickened.

(*To be continued.*)

Dr. A. L. Metz, who was appointed temporary Professor of Chemistry to fill the vacancy in the Medical Department of Tulane University, New Orleans, caused by the death of Professor Joseph Jones, has been elected permanently to the chair.—*Medical News.*

IT IS ASSERTED THAT MANY OF THE SO-CALLED MALT EXTRACTS SOLD ARE LITTLE OR NOTHING MORE THAN A STRONG BEER. TO WHAT EXTENT IS THIS TRUE?[1]

By Louis Emanuel.

An answer to the above query leads one to ask: (1) What is beer? (2) What are the properties of beer? (3) What are the properties of liquid malt extract?

Beer should be a fermented infusion of hops and barley malt. Good lager beer should have a specific gravity of 1·0159, contain 3·5 per cent. of alcohol and 5·5 per cent. of extractive. According to a German authority, the extractive consists of the soluble part of malt and hops, partly unchanged and partly converted into decomposition products; among the former are maltose, gum, dextrin, peptone, hop resin and alkaloidal substances; among the latter, glycerin and fatty acids. It will be observed that diastase is not mentioned.

One of the most important properties which a malt extract should have is the power of converting starch into sugar. F. Elsner, in his "Hülfsbuch für Chemiker, Apotheker und Gesundheitbeamte," says: "A good malt extract should be able to convert its own weight of starch into sugar, at a temperature of 55° C., in not more than fifteen minutes."

Six of the most popular malt extracts were examined, a sample of beer, also an infusion of malt. The following table will show comparisons:

Liquid Malt Extract.	Specific Gravity.	Alcohol.	Extractive.	Diastatic Power.	Quantity.	Cost.
		Per Cent.	Per Cent.		c.c.	
No. 1	1·046	2·5	13·	None.	300	$0.25
No. 2	1·042	3·5	11·	—	320	.25
No. 3	1·030	6·	10·5	—	320	.11
No. 4	1·038	1·75	8·	—	360	.17
No. 5	1·045	3·5	13·5	—	340	.17
No. 6	1·064	1·75	19·	—	360	.19
Infusion	—	—	10·	30 minutes.	—	—
Beer	1·016	3·5	5·	None.	500	.05

[1] Read before the meeting of the Pennsylvania Pharmaceutical Association, June 18, 1896, in answer to query 79.

The diastatic power was tested in the following manner: A 1 per cent. potato starch mucilage, made by rubbing 10 grammes of potato starch with 50 c.c. of water, pouring the mixture into 900 c.c. of boiling water, the boiling continued for half an hour, cooled to 55° C., and enough water added to make 1,000 c c. Of this mucilage, 5 c.c. were mixed with 90 c.c. of water at 55° C., and 5 c.c. of liquid malt extract added. This mixture was then put into a bottle and a temperature of 55° C. maintained by means of a water bath for five hours. Tests were made at first every five minutes, and later at longer intervals.

In order to confirm, or rather to ascertain, whether or not the above method was a fair indication of the absence of diastase the liquid extracts were evaporated at a low temperature (not exceeding 60° C.) to a thick extract, and treated in the manner recommended by Dunstan and Dimmock, but no better results were obtained. The presence of alcohol and the absence of diastase indicate into what class of preparations liquid malt extracts may be placed.

In this connection, the following, taken from U. S. Internal Revenue regulations, 1893, may be of interest:

A druggist is not required to pay tax as a rectifier for recovering alcohol previously used by himself in the preparation of his medicines. Nor shall any special tax be imposed upon apothecaries as to wines or spirituous liquors which they use exclusively with preparation or making up of medicines.

By the provision of Section 3,246, Revised Statutes, a druggist is permitted to keep spirits and wines, and to use them in combination with drugs in the preparation of medicines that are not beverages, and to sell such medicines without paying special tax as a liquor dealer under the internal revenue laws of the United States. But under the uniform rulings of this office, and the decisions of the United States Courts, he cannot, without subjecting himself to the special tax, sell spirits or wines that are not combined with drugs or materials of any kind, taking the liquors out of the class of beverages, even when he sells the liquors on a physician's prescription, and for medicinal use only.

Besides the medicinal compounds which a druggist is authorized to sell without paying special tax as a liquor dealer, although they contain alcoholic liquors there are other compounds containing spirits, which, while they are not medicinal, are non-potable articles that do not come under the head of distilled "spirits, wines or malt liquors" in contemplation of the internal revenue laws, and which, therefore, he is entitled to sell without paying special tax; *e. g.* toilet articles, such as cologne, bay rum, "ether with alcohol" for use in photography; benzine or ether with alcohol for cleaning purposes; castor oil and alcohol for toilet use, Florida water, violet water, etc., toilet articles made from alcohol, camphor and alcohol, alcohol, ammonia and whiting, a cleaning preparation, alcohol and shellac for painters, etc. Wyeth's malt extract, which

is held out as a medicine, has been represented under oath, by the druggists who manufacture it, as containing the chemical principles of diastase, dextrin and maltose in such strength as would produce nausea if it should be used as a beverage; this, and other like extracts of malt held out as medicines and not as beverages, are not regarded as medicines until facts brought before this office show that they belong in the class of malt beverages (liquor) referred to in Section 3,339, Revised Statutes. Meanwhile, druggists who sell them in good faith, as medicines only, are not to be called upon to pay special taxes as dealers in malt liquors on account of such sales.

THE DETECTION OF ACETANILID IN SOME CLOSELY RELATED SYNTHETICAL REMEDIES.[1]

By Frank X. Moerk.

The synthetical remedies embraced in this investigation are either immediate derivatives of anilin, $C_6H_5NH_2$, as

Acetanilid	$C_6H_5NH(COCH_3)$
Exalgin (methyl-acetanilid)	$C_6H_5N(CH_3)(COCH_3)$

or of para-oxyanilin, better known as para-amido-phenol. Of this the methyl-ether is called anisidin, the ethyl-ether phenetidin (their relation to each other and to their medicinally important derivatives is best seen from their formulas):

Para-amido-phenol	$C_6H_4(OH)NH_2$
Anisidin	$C_6H_4(OCH_3)NH_2$
Phenetidin	$C_6H_4(OC_2H_5)NH_2$
Methacetin (acet-para-anisidin)	$C_6H_4(OCH_3)NH(COCH_3)$
Phenacetin (acet-para-phenetidin)	$C_6H_4(OC_2H_5)NH(COCH_3)$
Phenocoll (glycocoll-para-phenetidin)	$C_6H_4(OC_2H_5)NH(COCH_2NH_2)$
Lactophenin (lactyl-para-phenetidin)	$C_6H_4(OC_2H_5)NH(COCHOHCH_3)$
Salophen (acet-para-amido-phenol salicylate)	$C_6H_4(C_7H_5O_3)NH(COCH_3)$

Of these remedies, phenocoll is the only one used in the form of the "hydrochlorate," the free base not being medicinally important; the word "phenocoll," in the following parts of this paper, refers to the important "phenocoll hydrochlorate."

Of the various tests that have been published for the detection and identification of acetanilid, none has had the scope given to it which is intended in this paper. Of these tests only one is based

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[1] Read at the meeting of the Pennsylvania Pharmaceutical Association, June 18, 1896.

upon the formation of a precipitate; one depends upon the generation of an odorous compound, the rest upon color reactions. Preference was given to the first of these, because when published by E. Hirschsohn, in the *Pharm. Ztschr. f. Russland*, it was offered as a means of detecting 5 per cent. acetanilid in phenacetin; therefore it had the same object in view as the present paper. This publication of Hirschsohn was abstracted in the AM. JOUR. PHARM., 1889, 77, as follows: "Antifebrin in phenacetin, if present to the extent of 5 per cent. or more, can be readily identified by making a saturated aqueous solution, and adding to this half a volume of bromine water. Antifebrin decolorizes the bromine water immediately, and in a few moments a crystalline precipitate appears. Phenacetin neither decolorizes the bromine water, nor gives the precipitate, which is supposed to be acet-para-bromanilide, and is almost insoluble in water." In Dr. B. Fischer's "Die Neuren Arzneismittel," sixth edition, p. 177, the test is stated as follows: "If 0·1 gm. phenacetin be dissolved in 10 c.c. hot water and filtered after cooling to the temperature of the room, the filtrate, upon addition of sufficient bromine water to impart a yellow color, should not become turbid. This test will indicate an adulteration with acetanilid, the latter being much more soluble in water than phenacetin, and therefore is to be found especially in the filtrate, giving, with bromine, a precipitate of para-bromacetanilid; allowed to stand for ten minutes, 5 per cent. of acetanilid can be detected with certainty." This test, according to B. Fischer, is also satisfactory in distinguishing between acetanilid and methacetin, the latter, in saturated aqueous solution, not giving a precipitate with bromine water. Flückiger, in his "Reactionen," states that phenocoll hydrochlorate in aqueous solution gives a temporary turbidity with bromine water, which becomes more permanent with a large excess of bromine water. These are all the references found relating to this test.

For the following experiments 1 per cent. solutions of *exalgin* and *phenocoll*, and saturated solutions of the less soluble *acetanilid*, *phenacetin*, *methacetin*, *lactophenin* and *salophen* were used, with these preliminary tests, proved that a decided excess of bromine water produced precipitates with acetanilid, lactophenin, exalgin and phenocoll, and a decided turbidity with methacetin; in the last three cases a distinct turbidity could be noticed as the bromine water was allowed to drop into the solutions, disappearing upon agitation, until

an excess of bromine water had been added, when the turbidity or precipitate became permanent. Exalgin in this test separated yellow oily drops. The tests were then modified, bromine water being added, drop by drop, during a period of five minutes, as fast as the color was discharged.

	c.c. Bromine Water Added.	Appearance after Stirring Five Minutes.
Acetanilid	2·0	Yellow liquid; white ppt.
Exalgin	0·8	Colorless liquid; white ppt.
Methacetin . . .	1·8	Yellow liquid, becoming colorless, pink, finally red-brown, slightly turbid.
Phenacetin . . .	0·6	
Phenocoll	2·0	
Lactophenin . . .	1·2	Liquid like above; distinct white ppt.
Salophen	0·1	Colorless, slightly turbid liquid.

By agitating the tests afterwards with a light petroleum-benzin it was found that the exalgin precipitate was readily soluble (yielding beautiful white crystals upon the evaporation of the benzin), the acetanilid precipitate slightly soluble (yielding a small quantity of crystals upon the evaporation of the benzin), while the lactophenin precipitate was insoluble; ether does not give such satisfactory results, as it takes up *all* of the precipitates besides coloring substances produced in the other tests. The bromine test, therefore, gave hopes of being applicable to the detection of acetanilid in all of the remedies excepting lactophenin; it, hence, was of importance to determine its sensitiveness with acetanilid solutions. With 1 : 2,000 solutions in distilled water the precipitate with bromine water could always be obtained after stirring for several minutes; solutions of greater dilution, 1 : 10,000, were not certain to yield the precipitate, even after prolonged standing or stirring. The test, therefore, should be practical in solutions containing not less than 1 : 2,000; this calculated to 0·1 gm. of any of the remedies with 10 c.c. water, would be equivalent to indicating 5 per cent. acetanilid—the claim made by Hirschsohn. To substantiate this and test its greater applicability, 0·1 gm. of each of the remedies were heated with 10 c.c. of a 1 : 2,000 acetanilid solution, the solution cooled, filtered and 5 c.c. of the filtrate used as before; the results, excepting with salophen and exalgin, were disappointing, as it was not possible to certainly distinguish between the tests made with distilled water or with the acetanilid solutions. After trying the effect of varying quantities of bromine water, added slowly or in one portion to so-

lutions which had been rendered neutral, acid or alkaline without better success, the test was finally given up as far as detecting 5 per cent. acetanilid in phenacetin, methacetin, phenocoll and lactophenin, was concerned.

The *iso-nitrile test*, depending upon the formation of phenyl isocyanide or phenyl carbylamine, C_6H_5NC, by heating acetanilid with solution of soda or potassa and a few drops of chloroform or a little chloral hydrate, and recognition of this by its peculiar and offensive odor, was next tried. This iso-nitrile test, it must be remembered, is a class reaction, all primary amines heated with alkali and chloroform giving rise to unpleasant odors due to the formation of isocyanides; its application for the purpose in view, therefore, resolved itself mainly into a question of determining whether the remedies other than acetanilid gave rise to phenyl isocyanide or to some other body interfering with the recognition of this. Dr. Fischer states that the odor is furnished by acetanilid and phenacetin, but not by methacetin or exalgin when heated for a short time. Flückiger states that acetanilid and methacetin yield it; phenacetin gives rise to it, or at least a similar odor; exalgin gives a different, not unpleasant, odor. It will be noticed that these statements are to a certain extent at variance with each other.

Tests were made by using 2–3 c.c. of the solutions of the remedies as made for the bromine test, an equal volume of 5 per cent. solution of potassa was added, the solution heated to the boiling point, a few drops of chloroform added, boiled again, and the odor noted after the excess of chloroform had evaporated. Salophen was the only one to yield an odorless product; the other tests gave rise to odors differing, however, from that of phenol isocyanide as obtained from acetanilid. The delicacy of this reaction leaves nothing to be desired, as it was obtainable with an acetanilid solution, 1 : 200,000, and some individuals will find even a greater dilution satisfactory.

Knowing that the value of the test would be increased if it were possible to remove the odors due to the other remedies, the use of potassium permanganate suggested itself, and was successfully used with all remedies excepting exalgin, where it undoubtedly caused the formation of phenyl isocyanide instead of improving the test. Acetanilid requires the use of but little permanganate in a blank test, and this did not interfere with the delicacy of the test; when, however, considerable permanganate had to be added, it was found

that 1 per cent. acetanilid in phenacetin might not yield the odor; the addition of a very small quantity of ammonia in such cases was found to at once give rise to the odor and to be unobjectionable in other respects. To more quickly reduce the permanganate, a mixture of alcohol and chloroform was found suitable.

A series of experiments, in which 0·1 gramme each of the remedies was dissolved in 10 c.c. of an acetanilid solution, 1 : 10,000, and the filtrate treated as will be described, demonstrated that 1 per cent. acetanilid in these remedies could easily be detected, and, if necessary, much smaller quantities. Pure exalgin, as stated before, gave rise to an odor, but this did not interfere with the recognition of phenyl isocyanide; pure phenocoll likewise gives a faint odor, which does not interfere; the others, when pure, yield tests destitute of odor.

The test for an adulteration with acetanilid is to be made as follows:

0·1 gm. of *methacetin*, *phenacetin*, *lactophenin*, *salophen* or *phenocoll hydrochlorate* are boiled with 10 c.c. water (salophen is the only one not soluble in 10 c.c. boiling water); then cool quickly by immersion in cold water and filter through cotton. To 2–3 c.c. of the filtrate add an equal volume of 5 per cent. solution of potassa (or soda), boil and add small fragments of potassium permanganate until the green color first produced gives way to a violet or purple after boiling; then add two or three drops of a mixture made of chloroform 10 c.c., alcohol 10 c.c., and water of ammonia 0·5 c.c.; boil and again add some of this mixture if the permanganate has not been reduced completely to brown manganic hydrate; after the chloroform has vaporized by standing a few moments, note the odor and compare it, if doubtful, with that yielded by a dilute acetanilid solution.

In testing exalgin omit the potassium permanganate, otherwise the test is made as above.

This method of applying the iso-nitrile test accomplished the object of the investigation, and will, no doubt, be found of even more extended application.

Mr. Michael Carteighe, who for fourteen years has been President of the Pharmaceutical Society of Great Britain, was succeeded at the last election, June 3d, by Mr. Walter Hills. Resolutions recognizing the Society's appreciation of Mr. Carteighe's services were passed by the Council.

COLOR TESTS OBSERVED WITH SOME SYNTHETIC REMEDIES.[1]

By Frank X. Moerk.

(1) Saturated solutions of *phenacetin, methacetin, lactophenin* and a 1 per cent. solution of *phenocoll hydrochlorate*, mixed with sufficient bromine water to give a pale yellow color, will, in a short time, become colorless, then pink-red, and finally brown; the addition of alkalies or alkaline carbonates will cause the pink or red color to become much deeper; lactophenin also deposits a white precipitate, while the other solutions remain clear for a considerable time, unless they are stirred, when a turbidity may be noticed.

(2) If solutions of the substances mentioned in the preceding test be thoroughly agitated with an equal volume of bromine water and then with half a volume of petroleum-benzin, the phenocoll hydrochlorate test will speedily develop in the aqueous solution a pale red or violet color, changing to a color probably best described as "crushed raspberry or strawberry;" the other aqueous solutions will become yellow and brown. Some of the benzin solutions, removed to small beakers and evaporated, will leave yellowish or brownish residues, the quantities being in the order—phenocoll, methacetin, phenacetin and lactophenin; if a little water be added to these residues and heat applied, phenocoll yields a yellow solution, methacetin and phenacetin purplish solutions, the first-mentioned being decidedly deeper in color, while lactophenin gives a hardly perceptible pinkish solution.

(3) 0.010 gm. *salophen* boiled for a minute or two with 5 c.c. solution of potassa (5 per cent.), and then agitated so as to mix the solution with atmospheric oxygen, will develop a green color; upon standing, the color may change to yellow, red or violet, but agitation will restore the green color again or develop a blue color. *This test is not given by any other remedy mentioned in this paper*, the solutions obtained being colorless.

(4) If to 0.010 of the following remedies, boiled for a minute or two with a 5 c.c. solution of potassa, a *very minute* fragment of potassium permanganate be added, and again boiled, *salophen* will yield a blue or greenish coloration; *phenacetin, methacetin, phe-*

[1] Read at the meeting of the Pennsylvania Pharmaceutical Association, June 18, 1896.

nocoll, *lactophenin*, *acetanilid* and *exalgin*, yellow and but slightly turbid solutions; after cooling by immersing in cold water, and supersaturating the tests with acetic acid, *salophen* becomes yellowish red; *phenacetin*, *methacetin*, *lactophenin* and *phenocoll* become purplish red (permanganate color); *acetanilid* yellow and then yellowish red; *exalgin* bluish green. This last test, upon addition of ammonia, then gives rise to a lilac coloration.

If too much potassium permanganate be added in this test, some of the colors will not be obtainable; there should be a turbidity, but not a distinct precipitate of manganic hydrate, after boiling with the added permanganate.

SUMBUL.[1]

By John H. Hahn.

The late Professor Maisch stated, in the *National Dispensatory*, after giving a brief description of the constituents isolated by Reinsch in 1848, and Murawjeff in 1853, that the chemistry of sumbul required further researches. It was this statement that prompted the writer to investigate the subject.[2] The root analyzed was obtained in open market, and reduced to powder by grinding.

1,000 grammes were thoroughly wetted with petroleum benzin and allowed to stand for two days; the whole was then transferred to a glass percolator and the drug exhausted. The percolate was evaporated until no weight was lost, and the residue devoid of the odor of petroleum benzin. By this means 17·25 per cent. of fixed oil was obtained, of a yellowish or yellow color, becoming blackbrown by age. It was thick, viscid, rather bland, but afterwards of a bitterish taste, and when rubbed between the fingers gave a disagreeable odor. It was soluble in alcohol, ether and bisulphide of carbon, and was readily saponified by a solution of potassa. Upon

[1] Read at the meeting of the Pennsylvania Pharmaceutical Association, June 18, 1896.

[2] *Query No. 82.*—It is asserted that a larger part of the sumbul root of commerce is fictitious; if it is so, what does it consist of, and how does it differ from the genuine?

In reference to this query, no evidence could be gathered which would warrant the statement made in the above query. In proof of this, four analyses were made, from as many samples obtained from as many different firms, and all gave the same results both chemically and physically.

adding a drop of sulphuric acid to three or four drops of oil, a crimson-brown color was produced, changing in a short time to a beautiful dark purple, and after twenty-four hours becoming brownish-black.

By mixing the above fixed oil with a quantity of petroleum benzin, and pouring the whole upon a filter, crystals were deposited, which were thoroughly washed with petroleum benzin, redissolved in bisulphide of carbon and allowed to recrystallize; further than this they were not investigated.

The drug contained 4 per cent. of moisture and 8 per cent. of a grayish-white ash.

NOTES ON THE RECENT LITERATURE OF BOTANY AND MATERIA MEDICA.

By George M. Beringer.

Dilem and Patchouli.

The source of the commercial product known as oil of dilem,[1] received from Java, and closely resembling oil of patchouli in odor, is the subject of two communications in the *Pharmaceutical Journal*, March 21, 1896, p. 222, from J. Ch. Sawer and E. M. Holmes.

The word *dilem* appears to be applied to the leaves of a number of species of Pogostemon, used for stuffing mattresses, etc.

From an examination of herbarium specimens, Mr. Holmes expresses the opinion that the dilem plant of European commerce is the Pogostemon comosus, Miq.

From his study of this genus, Mr. Holmes concludes that the true patchouli, Pogostemon patchouli, Pell., is really indigenous to the Philippine Islands. The plant is cultivated at Penang, in Java, and in India. He also concludes that the patchouli plant of Khasia and Assam, named in "Flor. Brit. India," Plectranthus patchouli, Clarke, is quite distinct, and that the leaves cannot be confounded with the true patchouli. It has cordate-ovate, acuminate, crenate-serrate leaves, with scattered hairs and flowers, in which the upper lip is hooded almost as in Scutellaria, with inflorescence, in a loosely

[1] From the semi-annual reports of Schimmel & Co., we glean that dilem leaves yield 0·9 per cent. of oil having a specific gravity of 0·962. The patchouli plant yields three cuttings at half-yearly intervals. It is important, in order to obtain the yield of oil, that the leaves be dried in the shade.

panicled cyme. It is now placed in a new genus, as Microtœna cymosa, Prain.

The Palmettos of the United States.

Prof. C. S. Sargent, *Garden and Forest*, Vol. IX, p. 151, in a paper on "The Tree Palms of the United States," describes the cabbage palm or cabbage palmetto, Sabal palmetto, and its technical uses. This palm inhabits the coast region of the Southeastern States, from an island off the mouth of Cape Fear River, in North Carolina, to Southern Florida, and along the Gulf coast to the Apalachicola. The large terminal leaf-bud of this tree is cooked as a vegetable. The custom is an extravagant one, as the removal of the bud kills the tree. The fibres of the young leaves are now used for making scrub-brushes. The top of a young plant with its bud is cut off, trimmed down to a disk of about 8 inches in length, and then, after the soft edible core has been removed, boiled to separate the fibres. The removal of the top kills the plant, and as one concern in Jacksonville alone consumes 7,500 buds a week, the time is not very far distant when the Sabal palmetto will become a rare tree. The trunks of this tree are found to withstand the attacks of the teredo, and are extensively used for wharf piles.

Prof. Henry Trimble, *Garden and Forest*, Vol. IX, p. 182, has examined the tannins of the palmettos and states: "That the reports which have circulated in regard to the tanning value of the palmetto have, no doubt, always referred to the scrub palm (Serenoa serrulata[1]), and excellent leather has been prepared from it. A recent sample yielded the following percentages on analysis:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Stem above ground	8·56	5·68	5·48
Root	7·46	4·43	7·58

The tannin is associated in the plant with a large proportion of red coloring matter, which has a tendency to make a dark leather.

[1] To the pharmacist the saw palmetto has acquired some interest, as the fruit has been claimed to possess nutrient value, and as a catarrhal remedy. It is lauded by the manufacturers of certain proprietaries, as possessing tonic action on the genital organs, and as reducing enlargement of the prostate gland. From a paper on the "Botany, Histology and Pharmacy of Saw Palmetto," contributed by Dr. H. H. Rusby, Mr. W. A. Bastedo and Prof. Virgil Coblentz, to the New Jersey Pharmaceutical Association, the following note is abstracted. The description of the plant is as follows: "The trunk is horizontal and sub-

The pure tannin gave reactions which indicated its close relationship with that from oak bark, and this is confirmed by the ultimate analysis.

Specimens of the cabbage palm examined yielded the following percentages:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Section near ground	10·04	7·80	1·79
Section near top	8·35	3·78	1·54

The credit has frequently been given to tannin for enabling the wood of this palm to withstand the attack of the teredo, but it is evident from these figures that this property must be attributed to something else.

A New Adulteration of Senega.

C. Hartwich, *Pharmaceutical Journal*, 1896, p. 290, describes the macroscopical and anatomical characters of a new adulterant of senega met in the European market. The author decides that it is the underground portion of Triosteum perfoliatum, L., a North American plant, known under the common names of fever-root, wild coffee and horse gentian, and growing extensively

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terranean at a depth of from 2 to 4 feet; 2 to 13 feet long, 6 to 8 inches in diameter; possessing ascending or erect branches, and fed by roots about ½ inch in diameter, and penetrating 4 to 10 feet deeper. Exceptionally, in very rich soil, the trunk will rise vertically even 6 or 8 feet high. The petioles are densely spiney-serrated, whence its name, though in dense shade these serrations are wanting. In hummocks the foliage is of a deep green, while in the open level woodlands it exhibits a yellowish shade, and on the coast-fringe it is of a distinctly bluish-green. The time of blooming varies from April to June. The fruit, when fully ripe, becomes black and glaucous. The branching spadices, of which there are several, form large, pendulous panicles in fruit, 18 to 24 inches long, weighing 6 to 8 pounds. Four panicles, yielding 40 pounds of fruit, have been collected from one plant at Ormund. The fruit is a one-seeded drupe, oblong-ovoid in form, ½ to 1 inch in length and about half as broad. The epicarp is rather thick and tough, and strongly cutinized. The sarcocarp is slightly fibrous or stringy. The putamen is crustaceous, thin, smooth and free from the contained seed." Prof. Coblentz obtained, on distillation, a small amount of volatile oil. Extracted with benzol, the fruit yielded a small quantity of essential oil, a trace of an alkaloid, an indifferent resin, a non-drying saponifiable oil and a fat. The alcoholic extract consisted largely of glucose and the acidulated water extract of vegetable albumin, dextrin and glucose.

through the Northeastern States and in the Northwestern and Western States likewise.

Media for Preserving Algæ and Fungi.

W. A. Setchell and J. V. Osterhout (*Botanical Gazette*, Vol. XXI, p. 140) have experimented with a number of aqueous solutions for the preservation of marine and fresh-water algæ for laboratory purposes. One per cent. chrome alum in either water or sea-water, according to the habitat, is recommended. The algæ, carefully selected, are washed free from dirt and placed in it at once and preserved until needed for examination. Very little washing is needed afterwards to permit of staining by any of the ordinary staining reagents. The color is not retained perfectly, but is generally better preserved than by any of the other media tried. The specimens must be kept in glass-stoppered jars; the addition of a small quantity of camphor or formalin is recommended to prevent mold formations. One per cent. chrome alum solution is also an excellent preserving fluid for use with fungi, mosses, ferns and even flowering plants, being considered by the writers superior even to alcohol for this purpose.

One to two per cent. solutions of formalin fix and preserve any ordinary vegetable tissue. While the color fades more rapidly than with chrome alum, the cell contents are preserved equally well. Formalin, in the same percentages, works excellently for fungi and the higher plants. Toadstools are preserved in their natural shapes, and in more or less of their natural colors, according to the species. Camphorated water is very useful when considerable collections have been made, and cannot be examined for several hours. Perhaps the most important use of camphor water is to preserve specimens already fixed by other fluids.

Cyanophyceæ are best prepared in solutions containing 1 per cent. each of chrome alum and formalin. Chlorophyceæ—chrome alum is preferred, but either of these media will answer. Phæophyceæ do well when placed immediately in 1 per cent. formalin in sea-water. Rhodophyceæ—the coarser forms may be put into any one of the three solutions, and be kept in a very excellent condition; chrome alum preserves more color than formalin or camphor water. For finer study, the writers recommend fixing in picric acid, washing and preserving in camphorated sea-water.

North American Cactaceæ.

The revision of the North American species of Cactaceæ, by Prof. John M. Coulter, is one of the most important of the contributions from the United States National Herbarium. The first part of this work, containing the genera Cactus, Anhalonium and Lophophora, appeared in June, 1894. The second part bears the date of issue as April 1, 1896, and revises Echinocactus, Cereus and Opuntia. Fifty-two species of Echinocactus are described, with habitat and specimens examined. Eighty-two species of Cereus are similarly treated, and one hundred and one Opuntia are enumerated. Opuntia vulgaris, Mill., becomes Opuntia opuntia (L.), Coulter; and Opuntia refinesquii, Engelm, of the manual, is now Opuntia mesacantha, Rof., and its geographical distribution is fixed as only west of the Alleghenies.

The Chemists' Exhibition, conducted by the *British and Colonial Druggist*, will be held this year at the Nation Skating Palace, Argyll Street, London, August 24th to 28th, inclusive. The one held last year was visited in the four days by over 19,000 people, and that success has been the reason for the management repeating it this year on a still more extensive scale.

Some interesting facts about *maple sugar* are given in the *Garden and Forest* of May 13th, by Professor F. A. Waugh, of the University of Vermont. The State of Vermont produced, in the season just closed, some 15,000,000 pounds of maple sugar, which is greater than the output of any other State in the Union. The tapping this year commenced about March 25th, and, after an unusually short season, which closed about April 15th, an amount of sugar below the average in quantity, but considerably above the average in quality, was collected. The use of improved evaporators gives cleaner and lighter-colored sugar than could be made in the old-style kettles, and the prejudice against the lighter-colored article is rapidly disappearing. It is probable that, without reference to this year's crop, the production of maple sugar in Vermont is on the increase, which comes both from the working of a larger number of trees and from better methods of manufacture.

The prices realized for sugar and syrup vary greatly. Some of the first sugar put on the market brought the makers 16 to 17 cents a pound, while a great deal was sold in the country markets at 7 to 10 cents. Probably the bulk of the crop sold up to date brought the producers 10 to 12 cents. Syrup sold generally at from 60 to 90 cents a gallon. The Vermont farmer feels that his sugar orchard is one of his best pieces of property. It has been estimated that such property pays 10 to 12 per cent. on the investment. Whereas, a few years ago, there was quite a tendency to cut maple trees and clear away the sugar orchards, the present feeling is rather to encourage the extension of the maple sugar industry.

EDITORIAL.

STATE PHARMACEUTICAL ASSOCIATIONS.

June is the month in which the greatest number of State Pharmaceutical Associations hold their meetings. We are always ready to give room to an account of their proceedings, especially when any business of a practical or scientific character is transacted, although we cannot devote the prominence to the "social features" which they receive in many of the associations. Judging from some of the programmes which have been received, the Olympic tendencies have run rampant in a number of the States this year, but it is only a question of time when such excess will effect its own cure.

We do not wish to insinuate the impropriety of a reasonable amount of social entertainment, but we do consider that it is at a considerable sacrifice of dignity when three prizes are offered for every paper read at a meeting, and that these prizes consist of such heterogeneous substances as tooth paste, "listerine" and subscriptions to a drug journal. It does not alter the case to have some of the prizes consist of $10 in gold. No one is going to give much time to a paper which *may* entitle the author to a bottle of essence of pepsin. Papers have been offered at associations in times past that have required months—and, in some instances, years—of patient research. Would the author of such a contribution allow it to compete for a bottle, or a hundred bottles, of some proprietary preparation, which he is required in his daily routine of business to buy and sell without a legitimate profit?

It would be an entertaining mental occupation for a pharmacist to sit down and figure out who finally bears the expense of the numerous prizes offered in the contests at the meeting of a State Pharmaceutical Association. It is not the manufacturer who offers the prize, for it is an advertisement for him or he would not do it; it is not the public, for the numerous members of that class are getting their remedies at wholesale rates; then who is it? Perhaps the pharmacist, who acts as the unwilling distributor without compensation, bears his share of the expense. We have heard much of the profession of pharmacy and of its equality with that of medicine; but what State medical society would waste time at a meeting by devoting it to guessing contests and racing events? The profession of pharmacy will be just what its members make it—no more, no less.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

MISSOURI BOTANICAL GARDEN. SEVENTH ANNUAL REPORT. St. Louis, Mo. 1896. Pp. 209. William Trelease, Director.

The contents of the Report for 1896 consists of Reports for the Year 1895; two Scientific Papers, three Anniversary Publications, four Library Contributions—the Sturtevant Prelinnean Library. Six full-page half-tone plates are distributed through the work, besides sixty-six plates, which illustrate the scientific papers.

According to the Director's report, as many as 30,000 people have visited the Garden on a favorable Sunday in September, thus indicating that it is appreciated by the people of St. Louis.

The Scientific Papers are: "Juglandaceæ of the United States," by William Trelease, handsomely illustrated with twenty-five full-page plates. "A Study of the Agaves of the United States," by A. Isabel Mulford, also fully illustrated. "The Ligulate Wolffias of the United States," by Charles Henry Thompson, illustrated with three plates.

The Anniversary Publication is an address on "The Value of a Study of Botany," by Henry Wade Rogers.

The whole makes a handsome and valuable book, which is published at a price which barely covers the cost of production.

ASEPTOLIN. A formulated treatment for tuberculosis, septicæmia, malaria and la grippe, with reports of cases. By Cyrus Edson, M.D.

A few years ago Dr. Edson would not have been suspected of taking part in an effort to introduce to the medical profession and the public a remedy under a fanciful name, and bearing a trade-mark. His pamphlet of seventy-nine pages is nothing more than a high-sounding advertisement of a preparation, which, if it is constituted as he claims, can be manufactured by any intelligent pharmacist. In order to surround this wonderful remedy with as much mystery as possible, the author has not been satisfied with his own "rough description of the method of manufacture," but has published the results of an investigation by Henry A. Mott, Ph.D., LL.D., who says he has found it to contain "a colorless, crystalline salt, which is new to the medical profession, being a chemical combination of absolutely pure phenol (C_6H_5OH) and the alkaloid pilocarpin. This pilocarpin-phenyl-hydroxide ($C_{11}H_{16}N_2O_2.OH.C_6H_5$)" he says, "exists in Aseptolin, dissolved in an aqueous 2·75 per cent. solution of phenol." Aseptolin, therefore, is composed of:

	Per Cent.
Water	97·2411
Phenol	2·7401
Pilocarpin phenyl-hydroxide	0·0188

Not satisfied with this apparently exhaustive report on its composition, Dr. Mott proceeds to describe the actual process of manufacture in such a lucid (?) manner as to have a deterring effect on the would-be imitator before beginning. After describing the method of preparing a strictly pure phenol by distillation, in which the first and last 10 per cent. are rejected, the exact procedure is given as follows:

"In the preparation of pilocarpin-phenyl-hydroxide, it is only necessary to weigh out an equivalent proportion of this purified phenol solution (after determining its strength by chemical analysis), heat the same to about 100° C. (212° F.), and then gradually add to it an equivalent amount of the pure alkaloid pilocarpin, when, on standing for ten or twelve hours, the uncrystallized pilocarpin-phenyl hydroxide will separate out. From this salt, Aseptolin may be directly prepared by following the analysis given above. The usual method, however, adopted on an extensive scale, is as follows: The highly purified phenol is diluted with distilled water until the percentage of phenol is reduced to exactly 2·75 per cent., which can be determined by the phenolometer. This is introduced into glass-stoppered receivers, which have been thoroughly cleaned with boiling water. In the receivers the right proportion of the alkaloid pilocarpin is put, so that as the phenol distils over and condenses, it immediately combines with the pilocarpin in the production of Aseptolin. The temperature of the receiver is kept reduced by means of a small stream of water, yet sufficiently high to insure the desired

union, but is never allowed to approach a temperature which would permit of the alkaloid suffering any other chemical change."

All of this is, of course, truly wonderful and appalling to those not familiar with the simplest chemical or pharmaceutical processes. Pharmacists, however, will be surprised only that any one of Dr. Edson's standing should be a party to a trade-mark remedy, and that he could get any chemist to write such drivel. Evidently Dr. Edson knew he was addressing the medical profession, and the record of cases from many physicians indicates that he well understood the weakness of his professional brothers. They will, no doubt, be deeply impressed with the statement that the strength of the purified phenol solution is determined by chemical analysis, and that it is reduced to exactly 2·75 per cent., as determined by the phenolometer.

BULLETIN OF THE NEW YORK BOTANICAL GARDEN, Vol. I., No. 1. The first issue of what will probably become a valuable serial contains the act of incorporation, list of members, officers, etc., constitution and by-laws, reports of secretary and treasurer, and an outline map of the site appropriated by the Commissioners of Public Parks for the Garden.

THE NEWER REMEDIES. A reference manual for physicians, pharmacists and students. By Virgil Coblentz. Second edition. New York. D. O. Haynes and Co., 1896. Pp. 82.

This is a handy reference pamphlet to the almost innumerable new remedies. Plant principles of recent introduction are included, along with synthetic and proprietary remedies. The name, symbolic formula, properties (physical, chemical and medicinal) and dose are given. Pharmacists and physicians will find it a convenient and useful work of reference.

DE LA ECLAMPSIA EN LA MATERNIDAD DE SANTIAGO Y EN ESPECIAL DE LA ECLAMPSIA TARDIA. Por el Dr. Adolfo Murillo. Santiago de Chile, 1896.

UEBER DIE WURZEL VON RUMEX NEPALENSIS, WALL. Von O. Hesse. Reprint from Liebig's Annalen, **291**, 305.

MITTHEILUNGEN AUS DEM PHARMACEUTISCHEN INSTITUTE DER KAISERLICH-JAPANISCHEN UNIVERSITÄT ZU TOKIO, JAPAN. Von Dr. Y. Shimoyama.

This reprint, although issued some time ago, has not previously been noticed in this journal. It contains a number of interesting papers, as follows: "Ueber das Vorkommen des Emodins in den Samen der beiden einheimischen Cassiaarten; Cassia Occidentalis, L. und C. Obtusifolia, L." "Ueber den Emodingehalt der Früchte von Rhamnus Japonica, var. genuina." "Ueber die einheimischen Aconitknollen." "Ueber das in der Japanischen, Zimmtrinde vorkommende Ætherische Oel."

INDEX TO THE ANNUAL REPORTS OF THE U. S. DEPARTMENT OF AGRICULTURE, for the years 1837 to 1893, inclusive. Washington, 1896. By the aid of this report one is able to cover the Government reports on any subject in a very short time, and it will be of the greatest value.

PRICE LIST OF SHARP & DOHME. Baltimore, Chicago, New York. 1896.

PHARMACEUTICAL ASSOCIATIONS.

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

The nineteenth annual meeting of this Association took place at Mt. Holly Springs, Pa., June 16th to 19th, inclusive. The early sessions were occupied in the transaction of routine business, such as President's address, reports of delegates and committees. An important departure from the customary sequence of business was made in the case of the President's address, which was postponed to the evening session, when it was delivered as a preliminary to the entertainment given at that time. By this means a much larger audience was obtained than usually attends the first session, and the confusion incidental to new arrivals was avoided.

The reports of delegates were of unusual interest, especially that of those who attended the State Medical Association, this body having extended an invitation to the Pennsylvania Pharmaceutical Association to exhibit a complete set of the National Formulary preparations at their meeting, to be held in Pittsburg, in May, 1897, which invitation was accepted, and a committee appointed to undertake the work.

The Committee on Papers and Queries presented an unusual number of interesting papers, of which the following is a brief summary:

Synthetic oils was the subject of a communication by Joseph Cave, who limited his paper to a consideration of those synthetic compounds which are used in perfumery. He considered that *ionone*, or the perfume of violet, heads the list in importance, and exhibited a specimen of a 10 per cent. solution of it, also one of "violet bouquet," made with it, in which one part of the 10 per cent. solution was mixed with 200 parts of pomade washings of violet, tuberose and jasmin.

Neroli is another synthetic product which the writer considered finer than the natural oil. *Jasmin oil*, *cassia oil* and *lilac oil* were also considered in the paper and samples of them exhibited.

S. H. Hill answered a number of queries offered by the committee. In relation to *pharmacists prescribing*, he thought it the duty of the latter to prescribe some remedy for the immediate relief of pain, but that it is not their place to give any remedy to be taken in continued doses.

In answer to the query concerning the value of the *drummer* to the pharmacist, Mr. Hill reached the conclusion that pharmacy had suffered financially at the hands of the "drummer" because he had encouraged business, that formerly was exclusively the pharmacist's, in other stores and barber shops. In the discussion which followed the reading of this paper, it was evident that the pharmacists present did not agree with Mr. Hill.

The query concerning the *increase or decrease of patent medicines* was answered by the same author, with the statement that the general public is yet brave enough to risk its physical salvation on any cure-all that is judiciously advertised. He, therefore, did not believe the nostrum traffic to be on the decrease.

Mr. Hill also answered the query on the *comparative desirability to the pharmacist of the old-fashioned generator and the present cylinder of compressed carbonic acid gas* with a strong recommendation of the latter. He also believed in *rock candy syrup*, softened rubber by allowing it to soak in

benzin a short time, and preserved oils of orange and lemon by 1 ounce each of alcohol and glycerin to each pound of the oil.

Finally, Mr. Hill offered the following questions and answer: "What, in the opinion of the Association, would be the outcome if pharmacists as a body would refuse to sell any patent medicine which is sold at a cut-rate price? Would it bring manufacturers to terms?" The answer was: "I, for one, have a strong impression that such action would set manufacturers to studying; but to be effectual, the action would have to be entered into by every pharmacist in the United States and Canada."

William B. Thompson contributed a paper on *eminence in pharmacy*, in which he dwelt on the opportunities open to pharmacists who turn their attention to science during spare moments, as illustrated in the lives of Scheele and Runge, a sketch of the latter being given in full.

Mr. Thompson also furnished a paper on the question—*to what extent is a pharmacist justified in prescribing?* in which, after considering the public, the physician and the dispensing proclivities of the latter, he concluded that it would be far better for each one to adhere to his profession.

Emile Ott contributed a *brief history of Scheele and his discoveries.* Also one on *how the microscope can be made valuable to the pharmacist.* *Rock candy syrup* was the title of a paper by the same author, as well as one on *Hoffman's anodyne.* His conclusion in regard to the latter was as follows:

"As the preparation is principally called for by Germans and German-speaking people, under the circumstances I think the pharmacist is perfectly justified in selling an article made according to the German Pharmacopœia; but he should always keep on hand the standard U. S. P. preparation in cases where it is ordered by the physician, so that he can accommodate all demands."

In regard to cloudiness of *syrup of krameria*, Mr. Ott had found that syrup made according to the Pharmacopœia of 1890 must have as its active ingredient a fluid extract made according to the same authority, and not according to the Pharmacopœia of 1880 or some other unofficial authority.

The same author believed that paregoric could be made just as well from tincture of opium as from the powdered opium; and submitted samples to substantiate his claims. He also had found that *syrup of hypophosphites with iron*, when freshly made as directed by the U. S. Pharmacopœia, is cloudy and only clears after standing some time. By using hot water to dissolve the salts he has always been able to obtain a clear syrup at once.

The *Making of an Herbarium* was the title of a paper by C. B. Lowe (see page 379 of this issue).

Wm. H. McGarrah read a paper advocating a less number of *business hours for the pharmacist.* He believed that this reform might be accomplished if pharmacists would take hold of it in earnest.

Charles H. LaWall presented a contribution on *solid extracts* (see page 366 of this issue).

To what extent is a pharmacist justified in prescribing? has been noticed above as having been treated by two authors. Three more wrote in answer to the same query, namely, John F. Patton, F. W. E. Stedem and D. J. Thomas. All considered it ethically wrong for the pharmacist to exercise the functions of a physician, but claimed there were circumstances under which the knowledge of the former might be put to use, especially in cases of emergency.

Frank X. Moerk contributed two volunteer papers, one on *the detection of acetanilid in some closely related compounds*, and the other on *color tests of some synthetic remedies.* These papers are published in full in this journal, pages 389 and 394.

Notes on assaying gum opium, and the advantage of preparing the tincture of opium from the granulated drug was the title of a paper by Lyman F. Kebler, who strongly advocated the preparation of the tincture by packing 30 per cent. of the drug in a percolator in the usual manner, adding menstruum to cover the drug, and enough more that the remaining material will also be covered, dropping the remaining opium into the percolator, immediately beginning percolation and continuing until 10 per cent. of percolate have been obtained. The opium is always to be covered with the menstruum. After percolating about 10 per cent. of the finished product, the lower orifice is to be closed and the drug allowed to macerate about three hours. Percolation is then continued until another 10 per cent. of the finished product have been secured, and so on, percolating and macerating until exhaustion is complete. The author laid considerable stress on the importance of careful sampling.

J. A. Miller answered the query concerning the *high license law*, by stating that it is his belief that the law is an acceptable one to most druggists, and that it is generally observed. Only two prosecutions had come under his observation, in one of which an old offender was required to pay a fine of $2,500, and suffer imprisonment for eight months. The other case is still pending.

A paper from Louis Emanuel was read on the *comparative value of some extracts of malt and their difference from beer.* This paper is published in full, page 387.

Preliminary education of apprentices and the desirability of an *interchange of certificates between boards of pharmacy*, were subjects ably considered by F. W. E. Stedem in two papers.

John H. Hahn contributed the results of a chemical investigation of *sumbul*, which is published in this journal in full, page 395.

Finally, Emils Ott offered some information concerning an insect which sometimes infects vanilla beans. T. F. Main stated that to his knowledge such beans were never offered by importers as first-class stock, and were always to be had at a lower price than good beans.

After the reading of papers, the Association considered some amendments to the pharmacy law, which were referred to the Committee on Legislation.

The Association also put itself on record as favorable to the adoption of the metric system in the United States, and also as favoring tax-free alcohol for manufacturing and medicinal purposes. Concerning the latter subject, it was realized that such a proceeding amounted to little more than a formality, since the section of the law by which tax-free alcohol was to have been obtained has been repealed.

The following officers were elected: President, Joseph P. Remington; Vice-Presidents, A. R. Durham and C. D. Kiefer; Secretary, J. A. Miller; Treasurer, J. L. Lemberger; Assistant Secretary, D. J. Thomas; Executive Committee, J. H. Knouse, C. L. Hay and G W. Roland. The Kittatinny House, Delaware Water Gap, was selected as the place for the meeting in June, 1897.

The entertainments connected with this meeting were for the most part interesting and instructive in character. The visit to Carlisle on the afternoon

of the 18th was participated in by a large number of members. The features of that event were the inspection of Dickinson College, founded in 1783, and the Indian School. One evening was devoted to a burlesque college examination, in which a number of members acting as students were examined by Prof. Remington and Messrs. Kline and Redsecker. The papers presented as theses by this impromptu class were highly entertaining and in no small degree instructive.

The paper mill and printing office of Mt. Holly Springs came in for a full share of the attention of the visitors. The last day of the meeting was devoted to an excursion to the historic battlefield of Gettysburg.

THE CALIFORNIA PHARMACEUTICAL SOCIETY.

The annual meeting of this Society was held in San Francisco, at the College of Pharmacy Building, May 29, 1896.

The attention of the meeting was chiefly occupied with trade interests. This was in accordance with the previously arranged plan to administer the affairs of the Society separately from those of the California College of Pharmacy. The Society, therefore, considered such subjects as "The Patent Medicine Evil," "The Best Way of Dealing with Cutting on Proprietary Articles," and "How to Improve the Drug Business."

The loss of profits on patent medicines has been a severe blow to the pharmacists of that State, and the members of the Society were very much in earnest in their determination to remedy the evil. It was proposed to establish a manufactory by the Society and make a line of cough mixtures, liniments, alteratives, tonics, etc., to replace those produced by nostrum makers. This plan, it was thought, would doubly aid the pharmacist, though it would be severe on the wholesale druggist and the manufacturer. A committee was appointed to put the plan into operation.

THE INDIANA PHARMACEUTICAL ASSOCIATION.

This Association met in Indianapolis, June 3, 1896. President Moffett, in his address, recommended the employment, at a fixed salary, of a State organizer, in order to bring all the pharmacists of the State into membership, and thus form a body that could effectually deal with "cutters" and those who supply physicians with remedies ready for dispensing. This suggestion was, at a later session, adopted by the Association. One paper was read; it was entitled, "The Examination of Powdered Gamboge," and was by Mr. E. G. Eberhardt (see page 371 of this journal). Addresses were made by Prof. J. M. Good, of St. Louis, and Dr. J. F. Hibberd, of Richmond, Ind. The proposed pharmacy law was the chief subject discussed by the Association, and a preliminary draft of a bill was read and considered. The following officers were elected: President, Otto Gross; Vice-Presidents, Brune Knoefel, John Kennedy and Thomas Thornberg; Secretary, Arthur Timberlake; Treasurer, Grant Allen; Executive Committee, E. H. Burton, Charles Eichrodt and S. Muhl. The Association will meet in Indianapolis next year.

MISSOURI PHARMACEUTICAL ASSOCIATION.

The eighteenth annual meeting of the Missouri Association was held at Excelsior Springs, Mo., June 9th to 12th, 1896. In the address of the President,

J. M. Love, the U. S. Pharmacopœia and the National Formulary came in for a full share of consideration, and free alcohol was recommended.

The following papers were read and discussed: "Process for Spirit of Nitrous Ether, with Practical Demonstration," by Prof. David Walker; "What Shall We Do to Induce the Druggists to Become Members of, and Attend the Meeting of, the A. Ph. A. and the M. Ph. A.?" by A. N. Doerschuk; "How to Prevent the Cutting of Prices on Patent and Proprietary Medicines," by T. A. Moseley; "Semi-proprietary or So-called Elegant Preparations," by C. E. Corcoran; "The Future of Pharmacy in the United States," by A. N. Doerschuk; "The Professional and Business Aspects of Pharmacy," by T. A. Moseley; "Semi-proprietary or So-called Elegant Preparations," by R. J. Brown, of Leavenworth, Kas.; "Semi-proprietary or So-called Elegant Preparations," by J. M. Love; "Hints for the Benefit of the M. Ph. A.," by Ambrose Mueller; "Problems in Organic Chemistry," by Prof. J. M. Good; "Eighteen Years of Pharmaceutical Reminiscences in Missouri," by F. R. Dimmitt; "Methods of Detecting Drug Adulterations, with Illustrations," by Prof. Francis Hemm; "A New Method of Preserving Fruits and Flowers," by John Wright, of Indianapolis, Ind.

Prizes were awarded for papers as follows: Francis Hemm, $10 in gold, from the J. S. Merrell Drug Company; A. N. Doerschuk, $5 in gold, from the J. S. Merrell Drug Company, also a sponge case from Woodward, Faxon & Co.; Ambrose Mueller, a copy of the Era Formulary, from the publisher; David Walker, one dozen Listerine, from the manufacturer; C. E. Corcoran, one pair fine counter scales, from Henry Troemner, also fifty pounds of glycerine, from W. J. M. Gordon; J. M. Love, $5 in gold, from the J. S. Merrell Drug Company; J. M. Good, copy of the U. S. Dispensatory, from Meyer Brothers, druggists.

The Association adopted a resolution urging all institutions teaching pharmacy to require satisfactory evidence from each applicant for the degree of Ph.G., showing at least four years' time served in a drug store under the direction of a competent pharmacist.

The following officers were elected: President, Eugene Soper; Vice-Presidents, F. W. Sennewald, Dr. D. K. Morton, W. R. Scheldrup; Secretary, Dr. H. M. Whelpley; Treasurer, William Mittelbach; Assistant Secretary, Ambrose Mueller; Local Secretary, Thomas Layton; Members of the Council, J. M. Good, J. M. Love, R. E. Maupin, C. E. Corcoran and Miss Fredrica De Wyl..

Meramec Highlands, June 22, 1897, was selected as the place and time for the next annual meeting.

Professor John Attfield has resigned the chair of practical chemistry in the Pharmaceutical Society of Great Britain, after thirty-four years of service. The Council of the Society accepted his resignation on June 3d, and passed appropriate resolutions in recognition of his services. Professor Attfield is 64 years of age, and has in one way or another been identified with the Society ever since he became one of its early pupils. He is known best in this country by his text-book on chemistry, although his other literary work is of considerable importance, he having edited the last edition of the British Pharmacopœia, and is at present engaged on a new edition of that work.